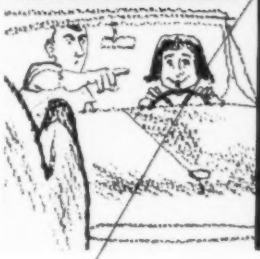
August 1959

AVAER 00-75-510

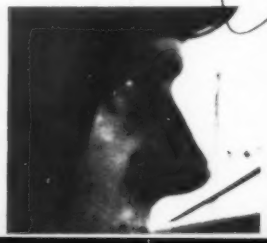
approach

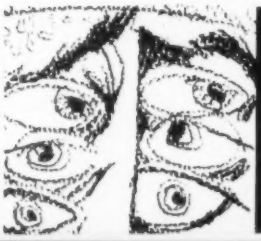
steps the aircra
operation to c
flight) break-i
phase of flight
outlined under
mal mixtures n
In addition, the
operational flig
ditions are such
in so far as low

ANYMOUSE



THE NAVAL AVIATION SAFETY REVIEW





GROW OLD
WITH ME

approach

VOLUME 5 NUMBER 2

Published by U.S. Naval Aviation Safety Center
NAS, Norfolk 11, Va.

Purposes and Policies: APPROACH is published monthly and contains the most accurate information currently available on the subject of aviation accident prevention. Contents should not be construed as regulations, orders, or directives. Material extracted from Aircraft Accident Reports, (OpNav 3750-1), Aircraft Incident, Flight Hazard or Ground Accident Reports (3750-10), Medical Officer's Reports (OpNav 3750-8) and Anymouse (anonymous) Reports may not be construed as incriminating under Art. 31, UCMJ. Photos: Official Navy or as credited.

Non-naval activities are requested to contact NASC prior to reprinting APPROACH material.

Correspondence: Contributions are welcome as are comments and criticisms. Views expressed in guest written articles are not necessarily those of the Naval Aviation Safety Center.

Printing: Printing of this publication approved by the Director of the Bureau of the Budget, 31 Dec 1957.

Subscriptions: Single copy 30 cents; 1-year subscription $3.25; 75 cents additional for foreign mailing. Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

Library of Congress Catalog No. 57-60020.

You Can't See If You Are All Wet!

The hazards of poor visibility during a carrier landing are obvious to everyone. Files of NASC contain case histories of landing accidents resulting from and associated with rain covered windshields. To improve visibility in precipitation the newer high performance aircraft are equipped with jet blast rain removal systems while others of less performance have windshield wipers. Some models now in fleet use have neither system. On these aircraft squadron personnel should apply rain repellent material in strict compliance with Technical Note 1-55. Care must be exercised during application. Use elbow grease as well as repellent material.

It is of interest to note that VF-101 has recently completed a flight evaluation of Dow Corning (FC-30) repellent for BuAer and recommended that this non-toxic material be procured in sufficient quantities "to provide protection to all aircraft." This material is now being delivered. Every squadron commander should assure maximum use of available rain repellent.

We've heard from the field that a cloth bag of makin's (smoking tobacco) used with plenty of elbow grease is an excellent rain repellent too.—Ed.

LETTERS

Fire Drill

Sir:

. . . Would like to call your attention to References on page 43, "Strikes & Spares," APPROACH, June 1959.

NavAer 00-80R-14 (U.S. Navy Aircraft Fire Fighting and Rescue Manual). Several noteworthy additions and changes have been made in this manual, amended 15 February 1958 and 15 March 1959.

NavAer 00-80C-501 has been superseded by BuAer Instruction 11320.13A.

Instructors Guide for Visual Training Aids has been superseded by BuAer Instruction 11320.11A.

BuAer Instruction 11320.4 has been superseded by BuAer Instruction 11320.4A.

Reference is made to the letter on Page 1 by LCDR R. A. Holmes, USN, concerning the open purchase of reflective tape.

Reflective tape in four colors is available in the U.S. Navy Supply System, See Section IV, paragraphs 4-52 to 4-58, pages 126 and 127 of NavAer 00-80R-14 for specification and Federal Stock Numbers.

CARL DREESEN
BuAer Fire
Protection Engineer

● **Our records have been brought up to date: Stock Nos. of tape were also published in APPROACH, Sept. 1958, in "Letters" section.**

Salvage Made Easy

Sir:

One of the most amazing airlifts on record was concluded at Cherry Point when a giant Marine helicopter delivered a twin-engine transport to the Air Station Overhaul and Repair Department.

The damaged SNB-5 transport, which weighs approximately 5615 pounds, was airlifted to Cherry Point from the Marine Corps Air Facility at New River, N. C. by an HR2S-1 helicopter.

The Marines decided to utilize the heli-lift because the plane was too wide for highway travel. Rail and water transportation were discounted because they were too slow and uneconomical.

The huge helicopter and its cargo were under the control of Captain W. E. Corley and Lt. Col. J. Etheridge of Marine Helicopter Squadron-461.

Traveling at an average speed of 70 miles per hour, the two pilots completed the 60-mile airlift without trouble in 51 and one-half minutes.

MCAS, Cherry Point

Please see "Lift-Out," page 29 for precautions while using this technique.

APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request. Address: APPROACH Editor, U. S. Naval Aviation Safety Center, NAS Norfolk, Va. Views expressed are those of the writers and do not imply endorsement by the U.S. Naval Aviation Safety Center.

Multi-"Fan"

Sir:

APPROACH is one of the few contacts with men of the fighting fleet for those sheltered individuals at shore duty type trade schools. Having flown big trucks vice blowtorches on the last sea tour I'm always interested in incidents and accidents for multi-fan specie. Don't the multi-engine pilots make mistakes anymore? I'm sure the boys in *Connies*, *Stoofs* and P2Vs are still making some dandies.

KEEP US ADVISED

● **Will do.**

Cover Girls?

Sir:

Enclosed are numerous pictures of S2F, HSS-1, and F2H-3 aircraft engaged in carrier operations aboard the USS YORKTOWN (CVS-10) during our just completed WestPac cruise. I hope they will be of use.

We "Stoof" drivers (S2F) will be awaiting each and every future issue with renewed interest in the hope of seeing one of our *Trackers* as an APPROACH cover girl.

LTJG J. P. SHEEHAN, VS-37

● **Many, many thanks. Other units are invited to send in photos of their pride and joy, as well as general flight operational and maintenance scenes useful in the general safety effort. In that connection, the following note on photo credits from "All Hands" is included.**

***"Photographer's credit line* — If you are a Navy photographer, chances are that some of your material has been used world-wide on TV, in magazines, in newspapers and displays. The credit line says: 'Official U. S. Navy Photograph.'" That is in keeping with "preserving the anonymity of naval photographers," as it says in the Manual of Naval Photography (OpNavInst. 3150.6A).**

However, have you seen Para. 0726 in the Manual? Here is what the paragraph says about credits:

"There is no objection to crediting naval personnel for photographs used in service publications such as

Continued from preceding page

APPROACH, All Hands, NavAer News, station papers, etc., provided that the photographer's rate or rank and the term 'Official Photograph—U. S. Navy' are included in the credits."

APPROACH would like to give you credit for the pix you're proud of —and some fine ones have been coming in. Whether you take them officially or are a shutterbug in your spare time, how about asking your PIO to add your name on pix that are sent to APPROACH? We like 8 x 10 glossies (no negative required), with captions and identifications as called for in the Manual of Naval Photography.

Cockpit Designs

Sir:

Two items in the cockpit design of the P2V-7 have been bothering me. Perhaps they are important enough to rate a revision, at least in future aircraft.

1. The landing light switch on the pilot's pedestal is just backwards. You have to pull up to lower the lights, and push down to put them back in the wings. Someday a hasty pilot will do what comes naturally, and possibly drop one each P2V in from about 15 feet. It seems so simple to reverse these: Am I correct, or not aware of some design requirement?

2. The selector switch for the pilot's microphones will rotate nicely; 360 degrees. A stop at the full counterclockwise position would give the pilots a starting point from which they could dial whatever they wanted, without looking. This "click system" was possible in the R5D, and saved much fumbling, particularly at night with dim cockpit lights.

3. Under existing BuAer instructions we can modify only one aircraft at a time (and then only if I can convince the commanding officer of need, naturally). Can you suggest best means for me to initiate a fix—whom we would clear it thru?

W. L. STRONG

● The landing light switch turns the lights ON, and lowers them at the same time. Through custom and habit, switches are always designed with ON in the UP position. It's just unfortunate that you think of *lowering* the lights, when actually what you want to accomplish is to turn them ON. Forget that they lower, and just think of which way you flip the switch when you walk into a dark room at home.

Click stops with a positive starting point would seem to be much better than the switch you refer to.

As to modifications, you must recognize that a certain degree of control must exist if there is to be any standardization of aircraft, otherwise there might be no two alike — and you might someday get the one with the landing light switch upside-down!

Plate Holder

Sir:

Have you ever wondered what to do with the approach plate commonly known as Flight Information Publication, Terminal, (High Altitude), East United States, so you could still read it as you made your let-down through the murk and rain in your VF/VA type? Turbulence bounces the book off your lap because the darn thing is too big to fasten to your regular kneeboard and it isn't wise to rip out individual pages; although I'm sure you've been tempted.

Buckle, right above, is filed open at one end for easy hooking and unhooking to clip.

The enclosed is my solution to the problem. The "clip" was open purchased (Steel Grip Paper Clasp, Regular, L. D. Van ValKenburg Company, Holyoke, Mass.) while the buckle and elastic were procured locally. Our parachute rigger has been doing the manufacturing and is now on the second dozen.

While improvements could be made — it does work, is light weight, takes up little room in the flight suit pocket when not in use and can be manufactured locally at low cost.

The holder is easy to use: Just put the thing on the off leg (i.e., no kneeboard, stick the FIPT (H.A.) EUS between the clips and start your approach.

Of course, it is versatile and can be used to hold maps, gloves, etc. Give the "holder" a try and if you like, pass the word on to the rest of the aviator types.

W. L. MURPHY
LCDR, USN

Self Starter Due

Sir:

Recently an AD-1 received a serious cut alongside the nose when the crank of an air compressor (low pressure type) flew off and struck the aircraft. The engine backfired, and the detachable crank was thrown off its shaft with considerable force.

The preventive procedure could be a collar to hold the crank on, or better yet, supply all compressors with electric starters. Several other compressors on the station do have electric starters according to reports.

ASO
VS-23

Thunderstorm Entry

Sir:

On page 29 "Whiz Quiz," May issue, you have a question referring to the correct procedure for thunderstorm entry. You state that the aircraft should be slowed down. This statement, while not being actually false, is some what misleading.

A better statement would be that the airspeed should be adjusted to the *best turbulent air penetration speed* or best maneuver speed. This speed will result in the maximum safety as regards both structural strength and stall characteristics. Appropriate flight manuals or technical orders should be consulted for this airspeed for the particular aircraft being flown. This provides the aviator with the basic reason for his actions, a more "professional" approach.

S. L. CHAMBERS, CWO
Aviation Safety Officer
Fort Sill, Oklahoma

Speed Trap

Sir:

. . . Your article "Speed Trap" in the June APPROACH paid dividends . . . Three students and instructors from _____ came in to the field in F9F8Ts. They had about 45-minute intervals. The runways were wet from heavy continuous rain. The first landed on runway 6, he felt the aircraft veering to the left, dropped his hook, got hook skip and ran off the edge of the runway to foul up runway 6.

Shortly after, the second came in and landed on runway 18 (6000 feet long). He saw he was fast so dropped his hook and engaged the arresting gear which is 900 feet from the end of the runway. Engagement was uneventful but certainly saved an overrun.

The third landed 45 minutes later on the same runway and did the very same thing. He also would have been an overrun if the arresting gear had not been available. The gear they used had been in place only one week. We have proof that it works. The pilots said they had no question about using the gear because they remembered reading your article "Speed Trap."

D. ALLISON
Sherman Field

● **See next letter.**

Shutdown

Sir:

In the "Speed Trap" (June 1959) you overlooked a method of stopping a jet fighter which, though not spectacular, is certain. I refer to the simple positive action of securing the engine on touchdown. Flood the runway with as much water as it will hold, throw in a random dry spot or two, add a modest tailwind component or a few knots extra airspeed, do nearly anything within reason to make things rough. Regardless, you have an almost ironclad guarantee that in any of our modern day fighters you'll have just enough momentum so as to need only very gentle braking action to turn off with ease at the far end of an 8000-foot runway.

Where the crossways are reasonably wide you could accommodate a dozen aircraft with a very short landing interval. This is in great contrast to that queasy feeling you sometimes get if you must be disentangled from the arresting gear and you wonder how your wingman is making out landing on the other runway. Or, worse, will he land on the other runway? Then too, even at the cost of a mild reversal of the preceding objecting, it must be mentioned that you can drop your hook with the engine shut down just as well as when you are receiving a healthy boot in the tail from the residual thrust of an engine at IDLE.

Over the past several months this shutdown procedure has worked perfectly for me on several occasions. During a penetration at Sherman Field, I had immediately announced my intention of securing the engine when informed of the large amount of water on the runway. The on-the-ball line crew was waiting at the far end with an air starter and had my F3H started with practically no delay. There is no reason why this couldn't be done every time.

I fail to see why, on balance, this shutdown procedure should not be the primary recommended method of stopping on wet runways.

A large crosswind component and a wet runway may make it rough in the F8U because you would lose nose-wheel steering and aileron control. With those conditions you would be in deep trouble anyway. Certainly shutting down and restarting entails less fuss than switching runways back and forth and having red flashing lights in all parts of the field while the gear is being reset.

It may not happen often, but one of the most heart-rending sobs you can hear during the tape recorder playback of Channel 1 is, "Ooops I missed the wires."

ROGER CARLQUIST, LCDR,
Service Test
Pax River, Md.

● **Agreed that shutting down on touchdown must be considered under unfavorable landing conditions; the advantages and examples of this technique were mentioned on page 6 in the article. However, using it as the primary recommended method of stopping on wet runways edges a little too far into the individual in the cockpit. Due to the variables you mention (wind direction and velocity, a few extra knots on final, runway length and gradient, etc.), the final decision should be made by the man with the throttle.**

The following from an earlier letter on the subject by CDR (Greymouse) Hunt is considered worth repeating:

"Take any figure that you can find for idle thrust of your engine with about 100 knots of wind down the intake (early phases of landing rollout) and multiply that by 100 knots in feet/second. Convert this answer from foot-pounds-per-second to Horsepower and see what kind of a truck you are driving at this point. Now take a typical landing weight and visualize yourself driving this 10,000-to-20,000-pound truck with 120 to 200 horsepower, wide open, down the highway. It seems to me that if you must stop in a hurry you want to get rid of that horsepower before you run out of highway.

"You can stop an A4D-1 in 2700 ft. in a dead calm, if you shut down right after touchdown."

Transferring?

If you've transferred recently, or moved locally, and have a personal *subscription* to APPROACH, please send your change of address to Supt. of Documents, Government Printing Office, Washington 25, D.C.

"Countdown . . . 10-9-8-7-6-5-4-3-2-1 . . . ready, set, GO! Those 10 numbers before "Go" are important, whether you're about to launch a mighty missile or a roarin' reciprocator.

"Like the first 10 minutes with your new skipper—which are pretty important to your remaining tour—the first 10 hours on a new or overhauled reciprocating engine set the stage for what's to come in its remaining service tour.

"From the 10th hour on, you'll be operating that engine to accomplish some specified mission—be it logistic, training, or combat; however in those 10 hours' slow time prior to its release for operational use, your recip is running only to prepare itself for the running that's to come.

"What do those first 10 hours mean to your engine, and to you? Tech Order 2-58 tells you all about what it means to the engine. And what does it mean to you? Well, you just might be riding behind it someday near the end of its tour, and you'll be mighty glad you treated it right in—

10
ach

tty
er-
its

ied
ior
the

ells
ell,
and

B
in
ne
er

cr

THE FIRST TEN

Technical Order 2-58 states the Chief of the Bureau of Aeronautics' policy relative to the break-in procedures and precautions to be observed with new or newly overhauled reciprocating aircraft engines.

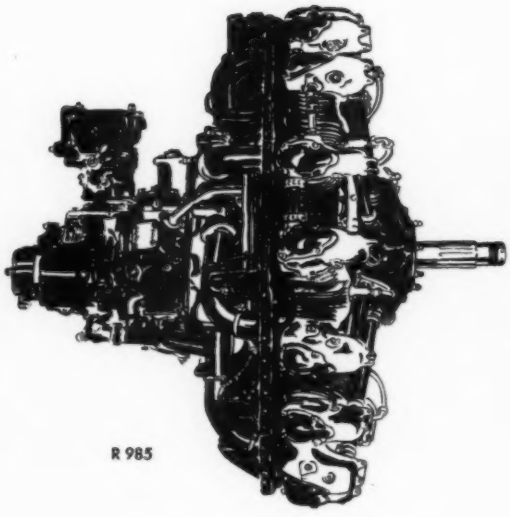
This TO is applicable to all reciprocating aircraft engines. In certain installations, such as in some helicopters, it may not be feasible to adhere strictly in accordance to the run-in schedules listed herein due to restrictions in certain speed ranges. In this event, the general discussion will apply and the run-in schedules will be adjusted so as to bracket the restrictive speed ranges. The important point is that load must be applied to break-

Continued from preceding page

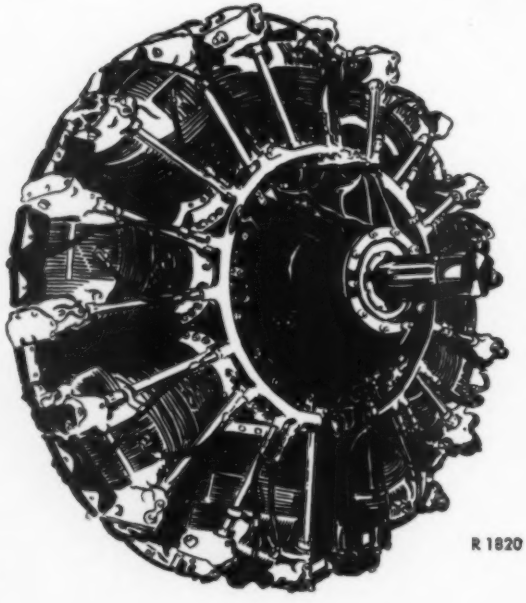
in an engine. Operation at idle speed or operation with the engine disconnected from the rotor in helicopter installations will not break-in an engine regardless of the time accumulated.

Several methods of breaking in reciprocating engines are recommended by engine manufacturers or used by the airlines. These methods vary from very short to very long and elaborate break-in schedules. For naval aircraft, it is considered that new or newly overhauled reciprocating engines, particularly those equipped with chrome plated cylinders, do require a certain amount of carefully controlled "running-in" before they are operated at high powers for prolonged periods of time.

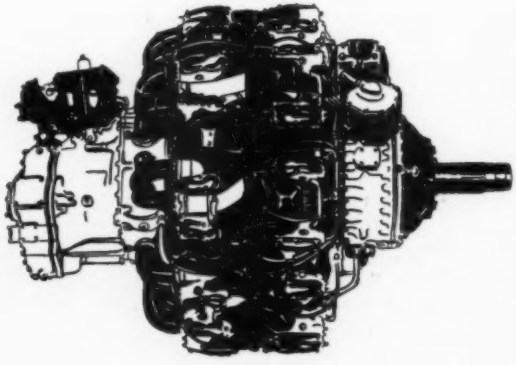
Even though the rubbing and bearing surfaces of new parts may be finished to a very high polish, the surface, when under a microscope, will show many minute high spots and valleys, some higher and sharper than others. These high spots, due to the excessive unit loading, will puncture the oil film and will cause metal to metal contact of the rubbing surfaces. When metal to metal contact occurs, friction heat will be produced and this heat will raise the temperature of the projecting high spots high enough for them to soften and flow into the relatively cooler valleys. As this metal flowing process continues, the bearing area is increased which in turn reduces the unit bearing pressures for a given applied load to the point where the oil film is no longer punctured. When the oil film is restored, the friction heat generated is reduced to the point where the affected parts will cool and the metal flowing process will cease. If the initial applied load is too high or if not removed to permit a restoration of the oil film in time, the metal flowing process will become uncontrolled and metal seizure or scoring will result.



R 985

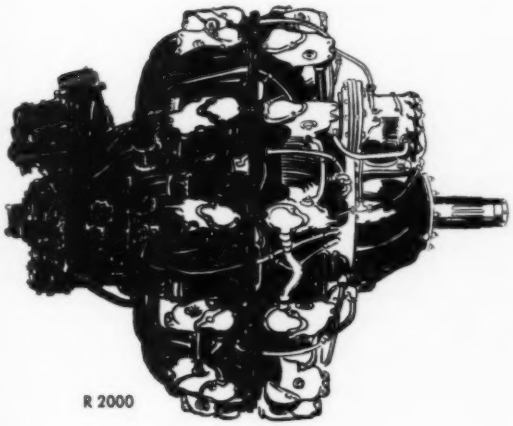


R 1820

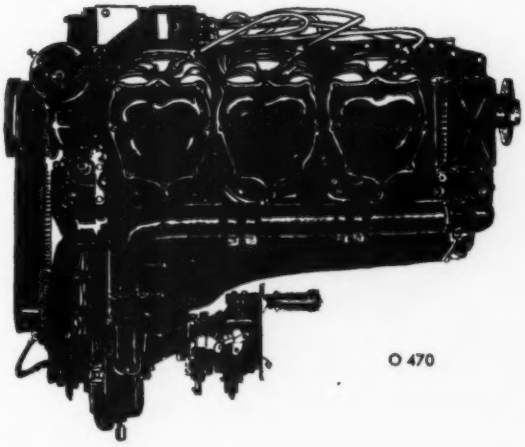


R 2800

Proper engine seasoning during the first 10 hours reduces the possibility of an early failure, whether it's an R-3350 or an O-470.



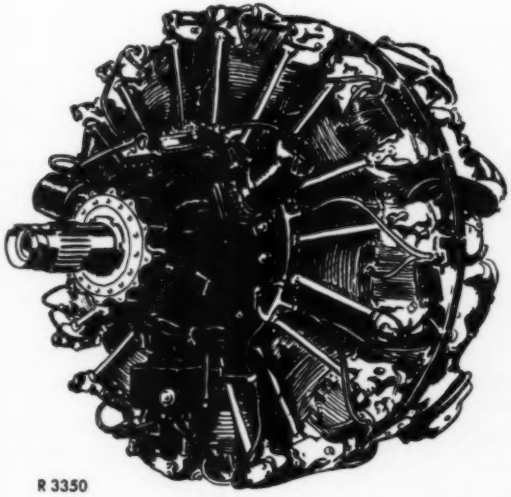
R 2000



O 470

Therefore, extreme bearing loadings such as obtained at high RPM and low manifold pressures or high manifold pressure at low RPM should be avoided. The applied loads should be moderate, gradually increased and periodically removed so as to properly control the metal flowing process.

New engines as produced by the engine manufacturers, if properly broken-in, will last a reasonable length of time. The first normal indication of those engines requiring overhaul will be excessive oil consumption caused by cylinder and ring wear. In an effort to prolong the life of these engines, the Navy is currently chrome plating engine cylinders during overhaul. This cylinder requires a still longer and more carefully controlled "break-in" period than formerly necessary.



R 3350

The factory run-in of new engines or post overhaul running of overhauled engines is of sufficient duration to insure that the engines are ready for flight operation if reasonable care is used but it should not be assumed that such engines are ready for prolonged climbs or cruise at maximum permissible powers at high airplane gross weights as required on military missions. Therefore, a 10-hour period of controlled break-in running is required except as otherwise noted below.

The break-in procedure as outlined below shall be followed by all activities installing a new or newly overhauled engine. In cases where the aircraft is to be ferried to another activity, steps outlined below shall be accomplished by the installing activity as a minimum and the remaining steps accomplished by the ferrying crew and the receiving activity.

Initial Start and Warm-up

During all ground running, the engine is to be operated with the propeller set in low pitch and

Continued from preceding page

the airplane headed into the wind in a dust free area with the cowling installed to provide the best possible degree of cooling. Also the engine instruments are to be under the close scrutiny of

experienced personnel at all times. Prior to the initial start, the engine is to be depreserved, *pre-oiled* and depreservation plugs installed in accordance with existing instructions applicable to the engine involved. See General Engine Bulletin No. 79, Revision A for precautions to be taken to prevent "hydraulic lock." After insuring that the engine has been completely depreserved and that there is no excess oil in the cylinders to cause "hydraulic lock" remove the depreservation plugs, if used, reinstall the sparkplugs and start the engine in accordance with the instructions contained in the flight handbook or in the aircraft maintenance manual. The engine should first be operated at the lowest practicable idle speed (RPM) until the oil temperature reaches 40°C or until the oil pressure stabilizes. Following "warm-up" the engine should be operated in the 1000-1400 rpm range for 15 minutes followed by a speed reduction to idle for approximately one minute for cooling purposes. Then shut down the engine. Following shutdown a visual inspection shall be made for oil leaks, security of fittings, etc.

Ground Run-in

After completing the initial start, "warm-up" and installation inspection, the engine shall be subjected to a ground run-in period of one to two hours, preferably the latter. During the break-in run, it is important to operate the engine to progressively higher power intermittent bursts with sufficient intervals at low power in between each burst to allow the engine to cool. Also, as take-off power is approached, the speed increase increment for each burst should be reduced and held for a shorter period of time and with the cooling off period correspondingly increased. Therefore, a schedule of operation shall be set up to operate the engine first at a low speed such as 1000-1400 rpm for best cooling and scavenging, then increase the RPM in 200 rpm increments for approximately one minute at each step until the power reaches 70% normal rated or 40 inches MAP, whichever first occurs. In between each period, the engine speed shall be reduced to 1000-1400 rpm for one minute for cooling purposes. For operation above 70% normal rated or 40 inches MAP, the engine speed shall be increased in 100 rpm increments and held at this speed setting for 10-15 seconds after which the speed shall be reduced to the 1000-1400 rpm range for at least three minutes for cooling. The schedule as outlined above is to be repeated as necessary until at least one or preferably two hours of ground running is accumulated. If at any time it is necessary to stop the engine during this ground running period, the engine is to be warmed up in the 1000-1400 rpm range and the running schedule continued at the next lower speed used before the stop was made. The running time required to make carburetor, fuel pressure, oil pressure and other adjustments may be included in the total ground run-in period. The oil used during the ground running shall be replaced and the strainers checked prior to the first flight. If metal particles are found, carry out the procedure given in General Engine Bulletin No. 165 for metal contamination.

Flight Test

After ground running, a flight test for at least one hour should be made. For this initial test flight, the airplane gross weight shall be kept to the minimum practicable for the flight, i.e., minimum fuel weight in addition to other things. This test flight should be flown within gliding distance of a field if operationally feasible. Full power should be used for take-off but the power and RPM should be reduced to climb power as soon as it is safe to do so in order to hold the time at take-off power to a minimum. It is equally important to avoid prolonged operation at climb power—do not climb to the maximum ceiling of the airplane. Rich mixtures should be used. Set airplane climb speed for best cooling for the power used and take care to insure that the specified temperature and manifold pressure limits are not exceeded at any time. During the flight test, the engine controls should be moved slowly to moderately fast, keeping constant watch for any unusual indications on the engine instruments. Power settings above minimum cruise should be gradually increased with approximately 100 rpm increments for durations of one minute at each increment with a sufficient interval at low cruise power to allow the engine to cool.

Ground Check

Upon completion of the first flight test, a high power ground run-up for approximately one minute should be made. A strainer check and a visual inspection, particularly checking all hose and installation connections shall be accomplished before the next flight.

Restricted Flight Operation

After satisfactory completion of the foregoing steps the aircraft may be released for limited flight operation to complete the 10-hour (ground and flight) break-in period. In general this latter phase of flight operation should be conducted as outlined under "Flight Test," except lean or normal mixtures may be used for low cruise power. In addition, the time may be accumulated during operational flights of multi-engine aircraft if conditions are such that these provisions can be met in so far as low power operation requirements are concerned.

During the first 10 hours of operation (ground and flight) a warning tag, form NavAer 1097, shall be prominently displayed in the pilot's cockpit. After completion of the 10-hour operating period, the warning tag shall be removed. Failure to remove tags promptly will eventually result in laxness of adherence to the restrictions, as outlined above. The oil shall be changed and the strainers and sump plugs checked after completion of this break-in period. This 10-hour break-in period does not include test cell time logged by the engine contractor or by the overhaul activity but is in addition to such time.

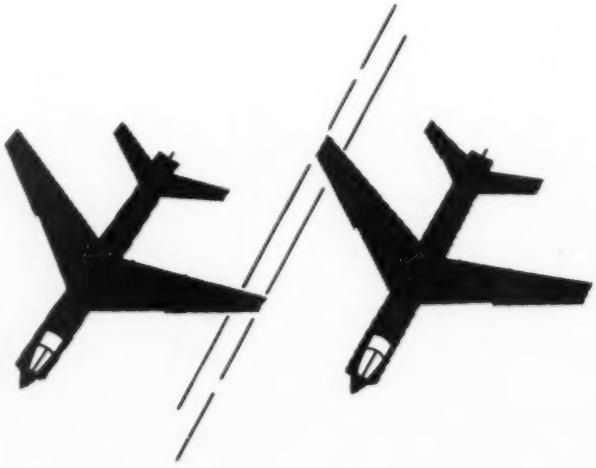
When one or more unplated prelapped cylinder, piston and ring assemblies are used for replacement in the field the foregoing break-in procedure may be shortened to one hour (ground and flight time). When field replacement cylinders are not prelapped or are chrome plated, the break-in procedure may be shortened where necessary to a total of five hours (ground and flight time) except where chrome plated cylinders are used on the master rod locations of R-3350 engines. In the latter case, the complete break-in procedure shall be used.

Line Drive

SCHEDULED for advanced tactics in an F8U, the pilot preflighted his aircraft then lit off the engine. After completing pre-taxi checks he added power and eased straight ahead under the direction of the plane captain. The plane captain was on the right side of the cockpit but after the F8U moved a short distance he became partially obscured from the pilot's view. It was at this time that the plane captain gave a "left brake" signal which was not seen by the pilot. Assuming he had adequate clearance, he continued taxiing straight ahead.

Some 10 feet after the forward movement began the starboard wingtip hit the port tip of an adjacent aircraft and though another lineman gave a "stop" signal, momentum carried the star-

Checking wingtip clearance on swept wing aircraft requires no extra time on the pilot's walk around but it does require a conscious glance. In the incident described the aircraft were parked so that the wingtips overlapped as shown by the drawing.



board tip up and over the other aircraft's wing.

It was immediately apparent, after the thing happened of course, that a parking problem had existed. The taxiing aircraft had been parked four feet to the right of its intended spot while the adjacent aircraft had been spotted four feet to the left of its correct position. Instead of adequate clearance an eight-inch overlap of wingtips occurred.

Both plane captain and pilot received a share in the blame—the plane captain because he failed to signal the pilot to fold his wings when coming out of the cramped spot or to have the pilot make an immediate turn. (It was considered that it would have been extremely close as to whether or not the tips would have cleared.) Pilot factor was failure to observe the overlap of the wings while preflighting. In addition he was not able to observe the unsafe condition while taxiing forward.

Since this occurrence all squadron line personnel have been briefed to signal the pilot to fold wings when there is inadequate or questionable clearance between wingtips.

FLAP TRAP — Receiving a "thumbs-up" from the plane captain, the pilot of an F9F-6 received taxi clearance and moved off toward the duty runway on a scheduled familiarization flight. Weather was clear with 10 miles visibility. A tailwind component of 6 knots existed but the duty runway had not yet been changed as the crash crew were engaged in rigging the emergency arresting gear.

The pilot had over 600 jet hours and 60 of this was in sweptwing *Cougars*. About the only item which might be considered out of the ordinary was his low amount of recent time in model. In the previous 14 months he had only one hour in the *Cougar* and this one hour had been flown six weeks before.

Clearance for takeoff was given and the pilot pulled onto the duty runway, held brakes and applied full power. Engine instruments indicated normal so he released brakes and began rolling; 7500 feet of runway was available.

After some 4500 feet of ground roll the aircraft became airborne in a steep, nose-high attitude. Immediately thereafter the right wing dropped abruptly and hit the runway. Still in a nose-high attitude, the *Cougar* swung to the right. It left the runway airborne but settled, hit and bounced, and the pilot pulled off the power and shut down.

Impact with a small embankment collapsed the nose wheel and sheared off the main gear then the aircraft slid 200 yards on its belly. There was no fire and no injury to the pilot.

Initial emphasis in the investigation was directed towards finding evidence of any mechanical malfunction which might have adversely affected the pilot's control of the aircraft. None was found.

In examining the plane immediately after the accident the board found both the wing flaps and the flap handle in the cockpit UP. The flaps were virtually undamaged in the crash and it was concluded they were not forced into the UP position due to impact with the ground. It was considered unlikely that the flap handle was inadvertently jostled to the UP position during the course of the takeoff because of the positive inboard movement required to release the handle from the down detent. The plane captain who observed the pre-taxi checks reported that the flaps were up when the airplane departed from the line.

Considering this information the board concluded that the pilot made the entire takeoff attempt with the flaps up. As a final phase of the investigation the board reviewed F9F-6 aerodynamic data. Takeoff distance for the existing conditions with

Photos added weight to the opinion that the takeoff was attempted with flaps up.

Continued from preceding page

full flaps was given as 4400 feet in the flight manual. There was no information on a flaps-up takeoff but the opinion of several pilots with extensive experience in the F9F-6 was that from 500 to 1000 feet more takeoff roll would be needed. Based on witnesses observations and marks on the runway the aircraft initially became airborne after 4500 feet of ground roll and left the runway 4900 feet from the point where the takeoff commenced.

In view of the facts the accident board concluded that the pilot attempted to lift the airplane off prematurely and stalled: The stall speed with flaps down is 15 knots below that with flaps up. Regarding ways in which the accident might have been prevented, the board said it would be superfluous to say that the pilot should have reviewed his checkoff list more thoroughly prior to takeoff. However one of their recommendations was for continuing efforts to be made to impress pilots with the importance of strict observance of checkoff lists.

ONCE AGAIN—With a five-plane flight of A4Ds scheduled for high altitude dive attacks (roll-in altitude 24,000 feet) it was decided to launch a weather hop to check conditions at the target. At approximately 0545 the pilot assigned to make the weather hop signed the yellow sheet and "rushed out to the aircraft to launch as soon as possible." This was in order that weather information would be available prior to the scheduled launch time of the flight which was 0620.

"After inspecting the aircraft externally," said the pilot, "I manned the cockpit. After strapping in I asked for starting power. The time was approximately 0555. As soon as I came around the horn for start, the nose gear commenced to collapse. I immediately reached for the gear handle and put it to the DOWN position.

"It was too late.

"The nose of the aircraft settled to the ramp and I cut the engine, crawled out of the cockpit and determined that no one was hurt . . . I do not remember the exact position of the gear handle other than it was not fully DOWN. I had not made a cockpit preflight prior to start in my haste to get moving."

Before and during the start the downlock safety pin was in but when hydraulic pressure built up the starboard ear on the actuator rod housing sheared, allowing the pin to come out and the gear to collapse.

The gear handle was not down when starting power was applied.

TALLY-HO—The pilot had filed a VFR flight plan and gone out to the SNB. His copilot and passengers were at a different location on the air station taking care of squadron business so he started the engines and taxied over to pick them up. Arriving at the line the pilot signaled for the airplane to be chocked but he kept the engines running.

Time passed and the copilot and passengers weren't ready to go. The pilot's patience began to suffer with the passing minutes with the thought of the miles back to home base and the delayed arrival time. Finally everybody arrived and as soon as they were aboard the pilot called for taxi clearance, got the chocks cleared away and swung out onto the taxiway.

During this time the copilot was busy getting into his seat, securing his belt and shoulder harness. After traveling only a short distance there was a thump and a scrunch of metal at the starboard wingtip. Tally-Ho! Contact had been made with a large box located on the parking ramp adjacent to the taxiway. The box, four and one-half feet high, provided stowage for line equipment such as chocks and fire bottles.

Though repairs were limited to several patches on the underside of the wing and replacement of the aileron all chances of a quick getaway and arriving home in time for dinner evaporated.

A LARGE DAY

or

Trouble comes in bunches

AS PART of a scheduled flight the pilot of an F8U-1 entered a loop at 15,000 feet and 500 knots. Nearly on his back at the top of the loop he discovered the engine had flamed out; RPM was down almost to 30 percent. This was trouble number one, but was only the beginning.

"About that time," the pilot said, "the aircraft went into uncontrollable inverted flight for about 10 seconds during which I was batted around the cockpit with considerable force. In fact, I was thrown about so violently that the wooden pencil stored in my left arm pocket was broken in half." Trouble number two arrived with the *Crusader* falling off into an upright spin to the right.

Spin recovery technique was applied and the pilot reached out to actuate the leading edge droop. Then the spin rotation stopped. "I was in a dive," he continued, "and did not blow down the droop but concentrated instead on recovering from the dive. My altitude when level was estimated at 13,000 feet — the emergency power package had been extended as I recovered.

"After recovering from the dive I turned on the emergency generator, reset roll and yaw stabilizers and pulled up to between 14 and 15 thousand feet and attempted to relight the engine."

The first two attempts were unsuccessful; the first in normal and the second in emergency fuel system. Slowing down to 250 knots a third relight was tried but it too failed. The altimeter needle swung past 9000 feet and it was time to think of other things. Namely, getting out.

This didn't go right either. "Pulling the face curtain didn't eject me," writes the pilot. "I then pulled the D-ring on the left side of the headrest and pulled the face curtain again. Still no ejection! I then attempted to jettison the canopy with no resultant action." The whole mess was snowballing into a nightmare however he still had one more plan. "I was going to try two more emergency relights, and if unable to start the engine I was going to open the canopy manually and dive over the side at 5000 feet."

On the next attempt there was no relight. No doubt feeling that there wasn't much use to try again, the pilot nevertheless made one more attempt to start the engine. Altitude by this time was down to 7000 feet. Then, success! Temperature and RPM started up and stabilized. "I remained in the emergency fuel system, climbed to 18000 feet and headed for home."

Relief over the relight was tempered somewhat by the thought that the seat was hot. "I made a high wide approach," said the pilot, "touching down on the runway as smooth as possible. I rolled to a stop using a very slight amount of brake.

"I did not open the canopy from inside the aircraft but secured the engine and sat uneasy until the canopy was opened from the outside and the seat had been disarmed. I then carefully, but expeditiously, got out."

Editor's Note: Inspection of the canopy actuator head and ejection seat catapult by Naval Proving Ground experts disclosed that both were in perfect operating condition but had been improperly rigged by maintenance personnel. In this case, ordnancemen were trained for the job and had primary responsibility; but because the cartridge had been removed so frequently while the aircraft was in the hangar for various reasons, the reassembly was done this time by other mechanics.

POOR MURPHY!

IF A MURPHY CAN BE LABELED INCORRECTLY, SOMEONE WILL LABEL IT THAT WAY!

LET'S get off Murphy's back. Broad though it may be, we detect a tendency to blame more on the poor gent than he deserves. Like this case, for example: "Murphy paid us a visit last week; recip engines don't run very long when the oil sump plugs have fallen out . . . and if tow bars are removed from a jet parked on an incline, it's bound to move if not chocked and braked . . ."

Some folks seem to be under the impression that if a man's gray matter isn't assembled correctly, anything that he does wrong is a Murphy. Far from it. By that reasoning we could attribute practically any malpractice to Mr. Murphy, and overlook the real cause. Once a situation is credited to Murphy, it very often ends right there—". . . he (we) couldn't help it, it was a Murphy," they say.

Let's restate Murphy's law and dissect it a bit—"if a part can be installed incorrectly, someone will do it that way." If a part *looks* like it can be installed *this* way, while actually it's supposed to be installed *that* way, and if it *can* be installed this way without forcing, bending or other distorting effort, that's a Murphy. Classic example: If two adjacent AN electrical plugs, same part number, are disconnected from their respective receptacles, and there's no marking to relate either plug to its proper mate, you have a Murphy situation.

A Murphy can be a design fault, as it is when a part is made without considering that someone might install it backward or upside down, or it can be a perfectly innocent part, like the AN plug, that just happens to get located alongside another identical plug.

Take a check on the tail-light bulbs in your car if you have turn signals. There's only one way they'll work properly, yet the conventional bayonet mounting would have permitted them to be installed two ways—one of them 180 degrees out. So, the manufacturer offset the pins in the bulb, and the slots in the receptacle, so that even you couldn't install it incorrectly. He designed *out* a potential Murphy, by anticipating what you might do.

Another bright example of anti-Murphy is in ordnance. For many years the designers and makers of rifles and pistols have faithfully followed the rule of making a part so it would fit properly only one way. Oh sure, you could possibly ram and bash a part in the wrong way, but they're assuming that you'll be taught to stop and look, and think, once you meet with resistance.

Now, when we get into airplanes and engines, we have a far more fertile field for Murphy's Law designs. Big, very complex machine. Many subcontractors. Cost. Manufacturing cost goes up when you make a part assymetrical to guard against Murphys. Take the camshaft drive gear on some cars—they're drilled with unequal hole spacing, so you *can't* hang the gear on wrong. Evenly spaced holes would have been easier, cheaper, but what a Murphy you'd find when you tried to get 'er running!

Let's not assume now, that manufacturers are to blame for all cases where Murphy's law is involved. They're trying to think ahead of you and what you're likely to do with their pride-and-joy, and most often they succeed. But—they're also assuming a certain level of training and of supervision. And the sub-sub contractor who makes the little twidget that fits *this* way, see?—he often is not fully aware of the level of training and supervision. He isn't aware too, that you'll be assembling his twidget at night, in the rain, on the rolling, pitching deck of a carrier, by flashlight, and that the Chief has been out there six hours straight and dashed in for a quick cup of coffee. Oh sure, he'll inspect your work when he gets back, but he's just reported aboard, he doesn't know yet whether you're a Steinmetz or a simpleton. You didn't have any trouble fitting the twidget to the widget, so he logically assumes you didn't bash it into place with a crowbar. He takes a look (%#*@¢ batteries on this flashlight) and it looks OK—there's nothing about the part to hint that it might be installed backward. Why? Because the part is about 5 feet away from the main gear that will come up and hit it when the pilot gets shot off the bow tomorrow. Jack it up and drop-check the

Man/Machine Considerations in Design

A workable match between the "average" mechanic and the machine must also be a prime design consideration. The concept of "Murphy's Law" can be related directly to the original design and, although minimized by explicit maintenance instructions, can be eliminated only on the drawing board.—*OIG, USAF*

gear? Heck no—it's not even part of the gear system. And besides, the chief is shouting for more tie-downs to keep her from going over the side—nix on jacks, not for this job.

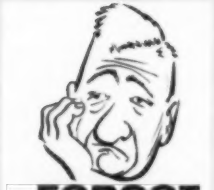
And there's your Murphy, all primed and ready to go. Who's to blame? Murphy? In this case, yes—Murphy sneaked in like the proverbial fog, "on little cat feet," and no one saw him. Quite often he gets caught before any harm is done. Sometimes he's found in the smoking ruins of a major accident. But, like the cat with nine lives, we never succeed in eliminating him completely.

What can *you* do about violations of Murphy's law? First, be reasonably sure that you've got a real Murphy. Not because we object to receiving Murphys that aren't really valid, *but because the proper cause doesn't get the blame when Murphy gets it.* Second, DO something about it. Send it in to APPROACH, and also bring it to the attention of the right people in your unit—don't wait for your boss to see it published in APPROACH, for he might have a Murphy-caused accident before he gets to read it. Third, guard against violations of Murphy's law by yourself. If a part is not perfectly symmetrical, but still can be installed more than one way, look out for Murphy's law—contrary to popular opinion, there's nearly always a reason for shaping a part a certain way, and the reason may not be readily apparent.

Poor Murphy—his law gets enough legitimate violations, let's get off his back and not saddle Murphy with the blame for ignorance, carelessness, inattention, and other human failings. Remember, if a part can be installed incorrectly, someone will install it that way.

ANYMOUSE

CRASH PROGRAM



ANYMOUSE, more often than not, concerns pilots and airplanes. Here's a hairy one 'bout a pilot and a truck. This pilot is also crash and salvage officer of a jet base. Recently he and his crew were plagued by a rash of blown tires, arresting gear engagements, unsafe landing gear, etc. The crash phone had sounded seven times prior to noon.

Bad day to say the least but in addition, the officer is rather shorthanded to the point where the CPOs must turn to. This very special day the crash and salvage officer had been heaving around and he showed it. His trousers were torn, his hands, face and shirt were quite dirty and numerous beads of perspiration had appeared on his brow. Placing and replacing arresting gear wire supports, dragging cable and chain, policing and repolicing the runway of debris, gets one quite dirty. The laboring officer and his crew hadn't taken time for a cup of coffee since about 0800 and now 'twas almost noon.

After each emergency situation the main runway (we'll call it the east-west) was closed and the duty runway changed to what we'll call the north-south runway; an undesirable one because of its shorter length and lack of arresting gear.

The purpose of Anymouse (anonymous) Reports is to help prevent or overcome dangerous situations. They are submitted by Naval and Marine Corps aviation personnel who have had hazardous or unsafe aviation experiences. As the name indicates these reports need not be signed. Forms for writing Anymouse Reports and mailing envelopes are available in readyrooms and line shacks. All reports are considered for appropriate action.

— SUBMIT AN INCIDENT, PREVENT AN ACCIDENT —

After each change of course all crash vehicles were informed by radio. Throughout the morning crash vehicles sped hither, thither and yon, always asking clearance to cross. All vehicles that is, except one. Yep, laboring officer in his pickup.

Eastward he sped along the closed runway, observed by the tower operator who was certain he'd stop at the "north-south." Certain he'd stop 'cause he was the crash officer, 'cause he knew this airport, he knew the north-south was the duty, but most of all he'd stop 'cause there was an F3H rolling out at something close to 100 knots.

When it became apparent the pickup truck wasn't going to stop and that the officer and *Demon* were on a collision course, the tower operator roared at an assistant, "Stop that pickup!"

Too late!

Fortunately, the crash officer caught a glint of motion off his side and in that instant he brought the pickup to a screaming whoa, all four tires smoking. The *Demon's* wingtip skirted the bumper.

Airplane driver to tower: "Tower, what's with this crazy pickup?"

Truckdriver to tower: "Tower, I was aware the north-south was the duty, I simply forgot."

Tower operator to himself: "Cheez!"

Talking the situation over some time later, when the crash officer had recovered from shock, we learned the *Demon* driver had tapped his right brake at just the right moment, else we'd have had to get a new pickup and new crash and salvage officer. Some words of wisdom from the officer were: "The man in charge cannot, must not, become so engrossed in details that he loses sight of the situation as a whole. I had simply become so absorbed in reopening the more desirable runway that north-south being the duty didn't register even tho' I recall the tower passing the word. That sort of thing can result in injury—Class A injury."

FUEL FAM

THIS activity had been operating R5D-2 aircraft for several years when an R5D-3 plush model was received. Two days later, on the first flight from the field, a highly qualified and experienced R5D plane commander was scheduled to give another well qualified pilot a plane commander check. Four minutes after takeoff No. 1 engine lost fuel pressure. The engine was feathered, secured, and

the plane returned for a landing. While taxiing back to the line No. 4 engine gave up and quit.

Back in the chocks a mech discovered that the fuel selectors were positioned to the "Auxiliary tanks" and the fullest aux tank contained only 40 gallons.

As most well versed R5D pilots know there's more difference between the dash two and dash three than the plush seats in the cabin. Not the least among these is the fuel system and most important—the fuel selector positions. If the fuel selectors in the dash three are placed in the same position that would be MAIN TANK on the two, fuel is actually being drawn from the auxiliary tanks. So, if one should happen to forget that he was driving the "Cadillac," and automatically put the fuel selectors all the way forward, well . . . he'd run out of gas when it was least expected.

CHALLENGE

FLYING an instrument flight plan, and actually on the gages, I was at 7000 feet and after making a routine position report received an altimeter setting from the ground station. This setting was given as 29.92 and I cranked it in.

A few minutes later I contacted approach control at my destination and was given the altimeter setting again. This setting was all out of whack with what I had just received. It was 29.22 so I called back and asked if they were sure. Approach control answered immediately that the altimeter setting was 29.22.

I don't like to get in these games but I challenged their setting again and pointed out that I had just received a setting of 29.92 at a nearby station and that the entire area was reporting in the 29.90's. After a short pause approach control came back and revised their setting to 29.92.

That erroneous altimeter setting would have put me 700 feet higher than where I was supposed to be. In an IFR situation the hazard is obvious. It is my belief that if a control tower or approach control is challenged on such matters, they should check their information before asserting themselves in a positive tone of voice. The situation was passed on to the duty officer for his information and corrective action.

BLOW TORCH

THE field was new, not yet open for full scale operation, and the control tower was not ready for use so we had to control our limited traffic from a small radio jeep.

About sunset an inbound was received on an aircraft which would arrive about 2000 that night. The duty officer thought it would be a good idea to check the runway and lights before it became completely

Continued from preceding page

dark so we drove a pickup truck down the runway then returned to the line. I got two Very pistols in case of need to warn of a wheels-up approach and put the pistols on the seat and the shells in the glove compartment of the truck.

About 15 minutes before the aircraft was due to arrive another man and I went out to the runway. I was at the end of the runway and the other man was about 2000 feet down the runway at the "runway portable." When contact was made with the aircraft I loaded both Very pistols and laid them on the hood of the truck. An uneventful landing was completed, then came mistake number one by me. I picked the pistols up off the hood and put them in the seat of the truck still loaded.

I drove down to the runway portable and the man there asked me to run him over to the barracks in the truck. I had forgotten about the still loaded pistols in the seat (mistake number two). We walked back to the truck, got in, and the next thing that I saw was a blinding flash. I felt like a horse had kicked me in the head.

At the hospital it took a score of stitches to sew up my neck and chin. At the investigation the other fellow's story ran as follows: "When I got into the truck I sat on something hard. I picked it up to see what it was and the next thing I knew it went off."

HELP OR HINDRANCE

WHILE cruising on an assigned mission the three S2Fs in our flight heard a jet pilot "hit the silk." We continued to chug merrily along, listening to all the talk that goes with a "Mayday!" Planes from every section of the state began giving the Coast Guard different vectors to the spot they believed the pilot to be down in.

Meanwhile one of our flight spotted something in the water. He went down to investigate, and, sure enough, there is the pilot in his raft waving to us. All this was reported to the Coast Guard who was enroute but even then jet aircraft continued to call in at 28,000 feet (and above) asking if they could be of assistance, . . .

Now I appreciate the natural concern a pilot would feel for another in trouble. But once the pilot has been spotted, an aircraft is orbiting the scene at 800 feet, and the rescue plane has good communications with the aircraft at the scene there is little anyone can do to improve the situation. The pilot was rescued with no sweat but Guard Channel was ravished that day.

WEAR & TARE

I WAS pilot of an HRS-3 and my assigned mission was to fly out to a large amphibious landing ship, land and pick up some empty 120 millimeter ammo cases for delivery to an artillery battery on shore. After landing on the ship, a loading officer came over and, though I figured he knew what he was doing, I asked him how much the cases weighed.

"Oh," he answered, "they're very light. They're empty." Reassured, I sat back and complacently let them start loading. In fact I really got too comfortable. After about 30 minutes of furious loading I became slightly suspicious and called a halt.

Clearing the small landing area of personnel I attempted to "lift off." I might as well have been tied to the deck with the ship's anchor chains. With a few angry looks at the loading officer I had the working party unload about 50 of the cans and again I tried to pick the chopper up.

This time I settled back to the deck from about four feet, in a spinning motion. An interested spectator who was in the way had to dive out of the way to save himself.

"This," I thought, "is enough!"

Now I had them unload half the cans still aboard the helo. Even with the load reduced so much I barely got off the ship under maximum power. No excuses from me. I was in command of the machine. Too late I found out those *light, empty* cans weighed 15 or 20 pounds. On a hot humid day with a tired HRS-3 it doesn't take much to overload it.

► *It is standard practice for Helo Transport pilots to figure lifting capability before loading and to tell the loading officer how much weight he may load aboard the craft. Density altitude considerations during hot weather are of prime importance in determining lifting capability. Wind condition at the time of takeoff is the other major factor.—Headmouse.*

FLIM FAM

MY TALE begins when a few of us young and foolish types got "re-qualified" for the *Beech*, and then lucked out and got one for a weekend. My previous experience in the monster was two hops as co-pilot (didn't touch anything) and one as passenger (slept the whole time) plus about 10 landings.

We set out on the first leg with handbooks and gear aplenty, refueled and finished the second leg to our cross-country destination (IFR most of the way). We stayed overnight then began putting ourselves together for the flight back to home base, planning on using the same intermediate refueling stop as before. On this leg the *other* young and foolish pilot wanted to "re-qualify" so he took the left seat.

He had planned on shooting some touch-and-go landings at the fuel stop but on arriving we were told that some commercial airliners were due any minute. Consequently we decided to make this one a final landing and shoot the touch-and-gos at home base.

The 180 position was a little close I thought and remarked on it to

the pilot. He didn't seem to think so and we continued the approach, ending up high and fast in the groove. About this time Braniff called downwind for a landing. The tower cleared him and advised his traffic was "Navy aircraft landing."

We touched down a little fast with about 15 inches mp and started to bounce merrily down the runway, edging toward the right. I had a firm grip on the seat cushion by this time but to top it all, the tower called Braniff to "use extreme caution, Navy aircraft *still* trying to land." We bounced off the runway to the right and I could see the two-foot runway lights with extreme clarity. With visions of us in the boondocks with the right gear gone I was about to grab for the controls when the pilot gave up and turned them loose altogether.

I applied full left rudder, pulled the power off, mashed left brake and said a little prayer. The left wheel hadn't gone off the hard surface and we swerved back onto the runway, using all of the 7600 feet. As the plane quivered to a stop the tower called to say that the last swerve had been a good one and that the cabin door had sprung open.

A thorough inspection of the aircraft showed no marks or discrepancies so we refueled and carefully made our way home. Two weeks later the Navy received a bill for $100 for repairs to a runway light that had been smashed by some knucklehead in an SNB who ran off the runway. I won't relate the repercussions that followed but needless to say I still have nightmares about the accident report that almost resulted.

ONE LUNG LOW

AFTER 45 minutes of flight in an S2F we found we had *gained* 150 pounds of fuel in one tank. On requesting advice from maintenance via squadron tactical frequency, we were instructed to feed both engines from the tank showing the increase. A fuel feed-back was suspected. An instrument approach was made with the tank still showing almost full.

On landing rollout the gage dropped from full to 350 pounds. Checking at the line we found the gas cap had blown off. A weak spring had let it come undone. The decrease of pressure over the wing sucked the fuel out and *collapsed* the tank, pulling it off the snaps inside the wing. The resulting smaller tank gave a full reading. With both engines using fuel from that tank it was almost empty after the full instrument approach. It could have been hairy with a double engine failure over the low station in the soup.

MAINTENANCE ERROR

This squadron operates many types of aircraft, among them A3Ds and P2V-5Fs, which have similar nose tires. A P2V-5F tire was accidentally mounted on an A3D rim and installed. The landing gears were dropchecked prior to flight and checked satisfactory. Several preflights also failed to catch the situation. On the first subsequent flight the pilot received an unsafe gear indication. He chose to dump fuel, abort the mission and return to the line where on another dropcheck the condition was caught.

It appears that heat built up during the takeoff roll expanded the tire to the point where the door would not close, giving the unsafe indication. In addition to endangering the aircraft, the men mounting the tire might have been injured if the tire designed for 85 lbs of air had exploded when inflated to 190 lbs, since there is no tire inflation cage available at this command.

ANYMECH

► This report was submitted with its purpose defined as follows:

"SAVE A LIFE OR PLANE—
SUBMIT AN ANYMECH"
"ANONYMOUS REPORT OF
MAINTENANCE
ERRORS"

"Pride in your job is part of the makeup of any good maintenance man. Being human, errors do occur. Unofficially let's help each other by anonymously airing your 'Booboo' so others may profit by your error. Place this slip in a blank envelope and drop in the safety officer's box in the readyroom.

"Narrative (1) What error? (2) Why? (3) What remedial action? (4) Is the posted procedure at fault? (5) Recommendations:

"No signature or approval required."

Readers perhaps have noted the new Anymouse Report which encourages reporting of all aviation safety hazards (APPROACH July '59). Whether a form is used makes no difference, the important thing is to report.

This report emphasizes the value of such reports, particularly if you have a similar aircraft operating situation.

Very resp'y,
HEADMOUSE

headmouse

Have a problem, or a question? Send it to HEADMOUSE— he'll do his best to help.

Gage Confusion

Sir:

No. 1 & No. 2 on RPM and MAP Gage Needles can be confusing during an emergency. Seems like L and R would be far easier to interpret. . .

LTJG, USN
VS Squadron

► Confusing is right—A check of specifications revealed the following:

Spec. "A" Says tachs will be marked 1, 2, etc.

Spec. "B" Permits pointers to be marked L & R.

Spec. "C" Provides no dash number for instruments marked "R & L"—In other words, if you tried to draw an instrument marked thusly, you can't get it because you can't identify it.

Spec. "D" Says manifold pressure gages will be marked with numbers.

Adding to the mix are specs saying fuel gages will be marked L & R for twin-engined aircraft and 1, 2, 3, 4, etc., for other multi-engine aircraft.

Overhaul shops remark pointers depending upon the original configuration.

Pending a study and possible revision of specifications by BuAer, we suggest you take your instruments to O&R Customer Service. They will mark pointers so you won't have a mix of instruments in your aircraft.

Very respy,
HEADMOUSE

Wires Crossed

Dear Headmouse:

Upon completion of flight the F9F-8B pilot griped, "IFF squawking Emergency when set on STAND-BY and OFF." The trouble was caused by the cannon plugs for the Coder control C-1272/APA-89 and the IFF control C-1159/APX-6B being interchanged. The plugs were put in the proper places and everything checked 4.0.

I suggest a change of position of male and female plugs to C-1272/APA-89 to insure this trouble does not occur again.

ANYMOUSE

► The fix you suggest was forwarded to appropriate authorities for consideration. Meanwhile, your letter should warn others of falling victim to Murphy's Law — Please see "Poor Murphy," page 14.

Very resp'y,
HEADMOUSE

Ungarbled Service

Dear Headmouse:

Have been studying comments by pilots for over a year in regard to RON and general messages sent through Flight Service. This service seems to work well over short distances; but over long distances the human element garbles the message or it doesn't reach the destination at all. End product — explanations upon arrival that are never well received or perhaps a "blast." Could it be that the new Navy teletype switching service will replace or augment this service (Flight Service) as far as the Navy is concerned?

ANYMOUSE

► Headmouse sends a regular message to home plate, and info's Flight Service.

Pro & Con

Dear Headmouse:

Would appreciate your views on the following from an aircraft accident report. "The pilot did not lower his tail hook, which he lists as an error in technique; for the AD-6 Flight Manual states: 'If the arresting hook is extended, the pilot should be able to sense the drag when the hook strikes the water, thus improving his judgment of the airplane's altitude prior to the touchdown.' I believe this to be an Old Pilot's tale. The time from the hook striking the water until the fuselage reached the water would be on the order of three-tenths of a second. It is my calculation that the pilot reaction time, from when he senses the drag, plus the aircraft reaction time would amount to more than three-tenths of a second. I recommend that tail hook extension be eliminated from the ditching procedure in order to keep only the essential and important items on this emergency check-off list."

ANYMOUSE

► Do not concur with this suggestion. Two recent successful AD type ditchings indicate that hook-down technique is best. Pilots' statements include the notation that the initial contact of the hook with the H_2O gives an excellent warning just prior to impact.

Believe that any aid in ditching is desirable. Why eliminate this one? Admittedly it requires one more item to be completed on check off for ditching but consider the advantage outweighs this. Maybe an old hand doesn't need it but how about the "nuggets?"

Very resp'y,
HEADMOUSE

Note to unmanned-missile personnel, NASC has established a missile analyst. In addition to any official correspondence you may have on the safety aspects of the subject, he'd also like to get Anymouse Reports on missile experiences.

QUOTES from AAR's*

*Aircraft Accident Reports

► "It is noted that this pilot had no Operational Flight Trainer time during the past 12 months. Records show the trainer to have been 'down' for no period greater than 3 consecutive days during the past six months. The attention of the commanding officer, Attack Squadron ——— is invited to the provisions of ComNavAirLant Instruction 1540.4A regarding periodic OFT requalification by all squadron pilots . . ."

► "The Forestry Department Fire Truck from Escondido, the San Diego county Sheriff's Department deputies, and the California State Highway Patrol all responded immediately to the scene of the crash. It is gratifying to note that all representaives had received rescue training from NAS Miramar in rescuing aviators from crashed aircraft. Although no rescue was required in this accident, fire fighting was initiated by the Forestry Department truck and the law enforcement agencies afforded immediate exclusion of spectators and aided in providing security at the scene of the crash."

► "While spirited efforts on the part of pilots must be kept within appropriate limits, it must be accomplished without unnecessary curbing of the initiative and zeal essential to successful combat operations. This task is inherent in command and flight leadership. Further it should be re-emphasized frequently that flight safety is not incompatible with maximum combat efficiency but rather is one of the means through which it is achieved."

► "This flight was scheduled and commenced as a cross-country well within the capabilities of the pilots concerned. It is the opinion of the undersigned that both pilots showed poor judgment in attempting to continue the flight when conditions became such that successful accomplishment of the flight might reasonably be in doubt. It is to be expected that pilots who have recently met only minimum flight requirements will have limited capabilities. To attempt to overtax these abilities is an 'accident waiting to happen.' This Group has in the past and will continue to emphasize to all pilots, both staff and tactical, to 'know thy own capabilities,' and not to over-extend his current proficiency."

'FLIP' QUIZ

See answers on page 48

1. The new Flight information Publications are based on flight being divided into what three phases?
2. For a jet flight you should carry in the plane:
   a. High Altitude Enroute charts and High Altitude Terminal books
   b. Same plus Enroute Supplement
   c. Same plus Enroute Supplement and Low Altitude Enroute Charts as needed
3. Where is there a comprehensive index of all information in the flight publications?
4. The colors black and green on the Enroute charts denote what type of facilities?
5. The use of the navigation facilities shown on the High Altitude charts is mandatory above what flight level (altitude)?
6. Special Notices are contained in both the Enroute Supplement and the Flight Planning Document. What determines which place?

If you have questions on the new publications, or wish to make suggestions, read "FLIP And What It Is" dated March 1959, published by the Aeronautical Chart and Information Center, 2nd and Arsenal, St. Louis 18, Mo. and send suggestions to the above address. This booklet had the same distribution as the Enroute Supplements, so your squadron should have some.

NOTES FROM YOUR FLIGHT SURGEON

Canopy Caper

WHILE making a simulated flameout landing approach, two weekend warriors on a cross-country flight in a TV-2 hit the edge of a ditch, sheared off the gear and went through a barbed wire fence before skidding to a stop in a cow pasture.

The front portion of the canopy was broken by a flying object, presumably a fence post. After unlocking the canopy, the pilot tried to raise it by means of the electric switch. However, the switch was inoperative due to the loss of electrical power. He climbed out through the broken canopy.

To help the copilot, the pilot tried to open the canopy from the outside by means of the hand crank but the crank had been damaged in the impact. His attempts to break the canopy with heavy objects also failed. Meanwhile, the copilot was trying without success to break the canopy from the inside with his bailout oxygen bottle. (For fear of fire or injury he had decided against trying to blow the canopy off.)

The copilot was released 45 minutes later when the crash crew cut through the canopy with a fire axe. Their arrival had been delayed because of lack of a direct access road over marshy ground.

The pilot and copilot overlooked two rules of common sense safety:

- The copilot did not insert the safety pins in his ejection seat. He sat in the armed seat three-quarters of an hour.
- Neither man was carrying a survival sheath knife with which he could have cut through the plexiglass canopy.

Preplanned and Practiced

EMERGENCY or unusual situations in flight demand skillful and rapid decisions based on mature judgment. The hampering effects of fear in such situations are primarily the result of uncertainty of procedure. The importance of preplanned and practiced solutions to emergency situations should be understood by all flying personnel.

—OpNavInst 3740.7, 25 June 57

Strap Stretched

WE KNOW that the nape strap of your APH-5 helmet has to give a bit when you pull your helmet on or you couldn't get it over your head. However if your nape strap has become badly stretched from normal wear over a period of time or from hard usage plus perspiration, see your parachute rigger and have it replaced. If you don't, you may lose your helmet when you need it most.

The pilot of an F8U-1 aborted takeoff. When the abort gear failed, the aircraft went over a 45-foot cliff and crashed in three feet of water. The pilot survived the accident. His APH-5 helmet worn with the visor down performed its protective function while retained but was lost in the whip-lash motion on impact. The nape strap had been stretched. The pilot sustained scalp lacerations in addition to his other injuries.

The flight surgeon reporting on the accident credits the integrated restraint harness system, which was locked and tight, with saving the pilot's life. His injuries are considered minimal, the flight surgeon states, when the destruction of the forward end of the aircraft is taken into account.

Heads-up Thinking

WHILE making a pull-up following a low altitude bombing run, the pilot of an A4D-1 experienced a flame-out. He traded airspeed for altitude, while heading seaward. As he reached 6000 feet at 150 knots, he pulled the face curtain and ejected.

After releasing the face curtain, he waited for seat separation. When this did not take place, he pulled the ditching handle and pushed the seat away.

Being aware that manual seat separation necessitates manual parachute actuation, he pulled the D-ring. The parachute deployed. The pilot was picked up by helicopter shortly after entering the water.

* * * *

The automatic parachute opening feature is disengaged when a conventional type lap belt is released by hand or an integrated torso harness restraint system is released by pulling the ditching handle.

Remember: Manual seat separation . . . manual parachute actuation.

Haste Makes Waste

WHEN the pilot arrived at FASRon for a scheduled night proficiency flight in an F9F-8 there were no aircraft in an "up" status. The plane captain and a qualified structural mechanic inspected the worn tire of an F9F-8 down for a port tire change and decided the tire was in a safe flyable condition for one more flight. The aircraft was placed in an "up" status.

The plane captain hurried his final pre-flight inspection somewhat because he had another aircraft to get out. Both he and the pilot missed seeing the pitot tube cover still in place. The pitot tube cover was found still in place on the aircraft following the accident.

Approximately 2000 feet after beginning his takeoff roll, the pilot noticed a lack of airspeed indication and decided to abort takeoff. He reduced power to idle and began braking. Shortly after he began to brake, the port tire blew; then the port and starboard wheels locked. The aircraft skidded straight ahead for approximately 1800 feet before coming to rest slightly to the port side of the runway centerline.

The pilot shut down the engine during final skidding. Fire broke out in both main landing gear assemblies. When the aircraft stopped, he secured the battery switch and evacuated the aircraft.

Among the comments made in the AAR is the following:

"The primary reason for this accident was inadequate preparedness for flight in that the aircraft was not properly preflighted by either the pilot or the plane captain.

Bring It Back If You Can

IF you find yourself in a survival situation and a piece of your personal survival equipment (such as a flare) doesn't work, return it to your squadron equipment officer if at all possible. Naturally, if this would jeopardize your survival or rescue in any way, forget it.

One of the best means of improving survival equipment and preventing future failures is to determine *why* it failed and this can only be done by subsequent examination of the equipment itself.

Basic Equipment

ON AN authorized primary presolo flight, the pilot-instructor raised the gear of the T-34B and closed the throttle to idle giving the student a simulated low altitude emergency at an altitude of 450 to 500 feet. The student eased the nose over to maintain flying speed and started a shallow turn to starboard. During the turn, he raised the nose attitude and raised the flaps. As the aircraft approached a stall, the instructor took control and added full power while at the same time he eased the nose over to regain flying speed.

Before a complete recovery could be effected, the aircraft struck a pine tree, shearing off part of the port wing. It hit three more trees in a wings vertical attitude before making contact with the ground in an inverted, nose low attitude. At this time the engine and cowling were separated from the remainder of the aircraft. The aircraft then rolled over its starboard wing, the empennage striking the ground, rolled again into an inverted attitude and came to rest.

Neither occupant was injured. *The lap belts and shoulder straps of both the instructor and student were locked tight.*

The instructor unstrapped himself and fell to the ground. The student who was in the forward cockpit was unable to move due to the small amount of room. The instructor lay down on his back and, putting his feet against the starboard wing, rolled the aircraft over enough for the student to evacuate the cockpit. There was no fire.

"These occupants' lives were saved in all likelihood by the most basic of all aircraft safety equipment—lap belt and shoulder harness," the flight surgeon states. "This should serve to re-emphasize the need for the proper usage of this safety equipment. The H-4 hardhat and goggles prevented possible injuries to the student's head and eyes. (Mud on the front of the hardhat and the goggles indicated contact with the ground.) We know that many people fly with loose shoulder harnesses and loose chin straps," the flight surgeon concludes. "THEY TEMPT DEATH!"

GROW OLD

RECENTLY I TOOK what I am sure is my last flight as a pilot of a military aircraft. I was a member of an outfit which was eliminated in the defense expenditure cutback, and I have ranked and aged myself out of active reserve duty. I would be less than human if I did not at this time look back on my years of flying and try to evaluate the factors which operated to keep me alive, as well as those mistakes which might have killed me.

I felt a resurgence of the impulse to buttonhole the boys and girls just beginning, whether in private or military flying, and say the magic words which will keep their bones intact, and send them home each evening, a joy to spouse and children.

I can say what I have to say without pride or arrogance, because I was a mediocre pilot. I learned slowly; I was not by any stretch of the imagination a "natural." My awareness of my limitations, I am sure, is one important factor to which I owe my life. I did not have the skill to toy with chance and stretch my craftsmanship beyond its capabilities. I would not slow-roll at less than five thousand, because I scooped out at least half the time; nor would I practice spins unless I had so much altitude that the ground seemed as remote as the moon.

There are two kinds of pilots who get hurt: clever ones and poor ones. The clever ones gradually acquire a confidence which may mislead them, and tempt them to cross the safety margin once too often; the poor ones are merely incapable. But there is one common attribute which both types possess: they lack imagination. Their thinking is narrow; they fail to consider the possible consequences of a breach of flight discipline, or an overextension of their abilities. They assume that all condi-

D WITH ME

tions at all times will be normal. They assume that the ground is flat without obstructions, that the old altimeter setting is good enough, that there is no other plane in the air, that the weather will hold, that the obsolete chart is reasonably accurate, that the fuel tank was topped, that the field is open, that the mags will clear in the air.

Change Constant

These are foolhardy assumptions, resulting from laziness and wishful thinking. If there is one thing we can be sure of in this journey through the cosmos on this thin-skinned pea of an earth, it is that change is constant, nothing is ever the same. It is apparent to me that the human race is invincible. You need only consider the fact that a man who knows he has only one life to live will offer it to eternity because he is too lazy, or too unimaginative, to take an extra minute to ask a mech how much oil was put in. Courage like that exceeds the tiger's.

I distilled a single rule from the potpourri of experience, a rule which contains just about all there is to flight safety. It is, however, a mere phrase, unless we extend it through every flight activity. It is simply "Never take anything for granted."

There are plenty of things which we are forced to take for granted without adding to the list. We must accept the evidence of our eyes and nose that the liquid in the tank is aviation gas, that the length of the runway is 8000 if Enroute-Supplement says it is, and that the propeller is pitched at the proper angle to pull the plane forward. We lean heavily on properly trained authorities for vital information, and if they fail us we cannot help it.

But there are those factors which can be checked personally,

Continued from preceding page

which should never be taken for granted. I learned one lesson fairly early, and the nearness with which I came to killing, not myself, but another pilot, had an extremely sobering effect.

I was lined up on the runway's center-line with a student under the hood in the rear cockpit, preparing for an instrument takeoff. Another plane was lined up in front, for the same purpose. My student was on the brakes, ready for full throttle when I gave the order. While I could not see over the nose of my plane, I did observe the wings of the first plane recede and disappear as it started down the runway. After a decent interval I told the student to roll, and I stayed on interphone to advise and correct him. He did so, and a few seconds later my guardian angel stepped in.

"Now look, buttonhead," he said to me. "The first plane started rolling, and you figure that he is airborne at the end of the runway by now. But you don't see it. You're just taking it for granted."

I popped the hood, took over, hit the brakes and throttled back. My aircraft stopped twenty feet short of the number one plane, which had aborted, probably because the student was veering off heading. I would unquestionably have chewed through at least one cockpit if I had continued. I would have had a memory very uncomfortable to live with.

Experience Expensive

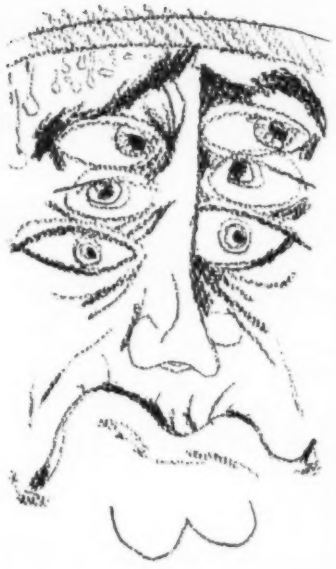
I owe to a certain vice of mine a good bit of the credit for the fact that my wife was cheated out of ten thousand dollars of NSLI insurance: I am an experience thief. I steal the experience of others.

Your own experience is the worst possible teacher despite the famous dictum. It is much too expensive. I enjoy the nasty habit of appropriating that of other pilots. Every time I read or heard of an accident I would ask myself: "Do I fly in such a way that it could have happened to me?" If the answer was yes, I did my best to correct my habits. Like a parasite, I stayed alive on the flesh and blood of others, and I admit it without shame. I love the taste of hamburger with catsup and onions, and I love my wife's embrace in front of the fireplace on a fall evening. My imagination is a vivid one, and when I fail to see the other plane in the traffic pattern when tower informs me it is there, I panic.

No more hamburger? No more kisses? The cold sweat breaks out, the right hand crooks convulsively for the rip-cord handle. No more baseball with my boys? The heart beats faster. The blood pressure rises. No more cans of beer on a hot afternoon? The breath comes short and hot.

Where in the hell is that other plane?

I turn right and left to seek it. I drop first the right wing, then the left.



Tower: "Nine zero four, are you having difficulty?"

Oh, no. How can the thought of a mid-air collision at a thousand feet suggest difficulty?

I make my voice calm. Nobody must know that I am afraid of a mid-air collision. After all, am I not a pilot?

"Tower from 904. I do not see the number one plane. What is his position?"

Tower: "He is over the end of the runway on final. You are number one to land."

"And how did it go today?" Cynthia says as the church key bites into the can of cold brew.

"Very nice," I answer. "Do you think it is chilly enough to light the fire?"

I knew two pilots whose tragic exits I was able to predict. One was a clever man, with an enviable skill and a superb practical and theoretical knowledge of aerodynamics. The other was a wise guy.

Casey the Ace

I loved Casey, the first one, like a brother. He taught me much about flying, and he was

for me St. Exupery and Jimmy Doolittle rolled into one. But he couldn't subtract. He didn't know when his units of safety were reduced to a dangerous minimum. His skill was his murderer.

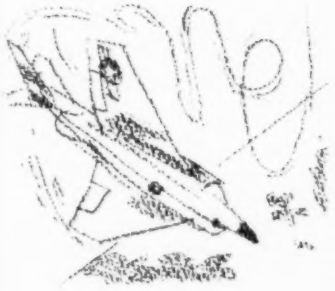
He could roll at two hundred feet and never scoop out. His aircraft was as his own body. This is a fine thing, but there are possibilities over which your skill has no control. Engine failure is one of these, and engine failure when inverted at two hundred feet is a troublesome event. A parachute is useless and your choice of pasture is severely limited, even if you complete your roll. Casey did not complete his, and scattered gas, guts, and gaskets over five hundred feet of ripening corn.

I was such a mediocre pilot that I never had the courage to attempt such intrepid maneuyers. I mourned the death of Casey, but my grief didn't help him. He has been long gone, and I am here tonight, as I write, watching the scarlet leaves of the maple drift by my window in the moonlight. And yet his craftsmanship far exceeded mine.

Marvell said it three hundred years ago:

"The grave's a fine and private place,
But none, I think, do there embrace."

But I love to stunt. You should see my triple sequence: the split-S, loop, and Immelman, coming right out on the original heading. I start it at ten thousand feet. I'm very proud of it.



The other pilot I shall call Grant. He was a likeable youth, but he lacked humility. He wore his cap on the side of his head, and made sharp turns to a landing. He would argue aerodynamics with pilots who had more hours of night flying than he had altogether. Can you imagine yourself advising Saint Ex on the best route to Dakar? Grant could have done it.

One day I said to him, after a particularly disheartening discussion (I think he was insisting that a plane in the air would weather-cock): "Grant, it matters not to me whether I win the argument, but if you fly like you talk you will kill yourself."

He snorted, re-tilted his cap to a more rakish angle, and stalked off whistling, "Off we go, ta-ta-ta-tum-tum-tum-tum."

I had no car, and he picked me up every morning to drive to the field. One Monday morning, two weeks after my melancholy prediction, he failed to show, and I had to hitchike. No bus.

The CO was on the phone when I loped in, an hour late. I was nervous and furious; we were flying a very tight schedule. I started blabbing when it was apparent that the CO was waiting for somebody at the other end.

"That damn Grant didn't pick me up this morning! It ain't my fault!" I pounded on the desk.

The CO started talking on the phone, and being versatile like Caesar, wrote a note for me on the pad.

"Grant was killed yesterday."

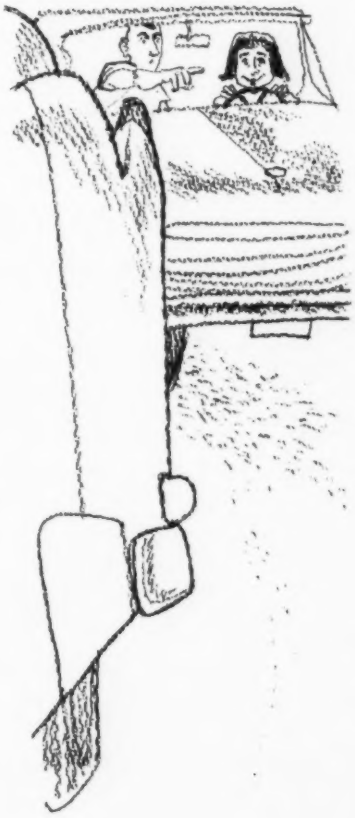
I had the psychic feeling of inevitability you sometimes get in a poker game when the card you draw is exactly what you expected. Of course, I said to myself. What else could it be?

He had his brother, a visiting cadet, in the rear seat when he pulled the wings off the trainer over Biscayne Bay. The only two boys in the family. And what did his mother think, I wondered. And what did his father say?

It is the same as in driving a car, of course. In tonight's paper is a picture of a new car a boy shattered against a tree on a sharp turn. The speedometer stopped at 110. My wife is a cautious driver; too cautious, I tell her. She misses golden opportunities to pass other vehicles while I fret and fume. You should estimate relative motion better than that, I tell her.

But who skidded off the road one evening and messed up our family wheels in a stump-filled ditch? You know who.

I said that Casey didn't know how to subtract. I referred to



Continued from preceding page

my formula for safety. According to my ingenious reckoning safe flight is maintained only when you stay above a certain number of what I call safety units.

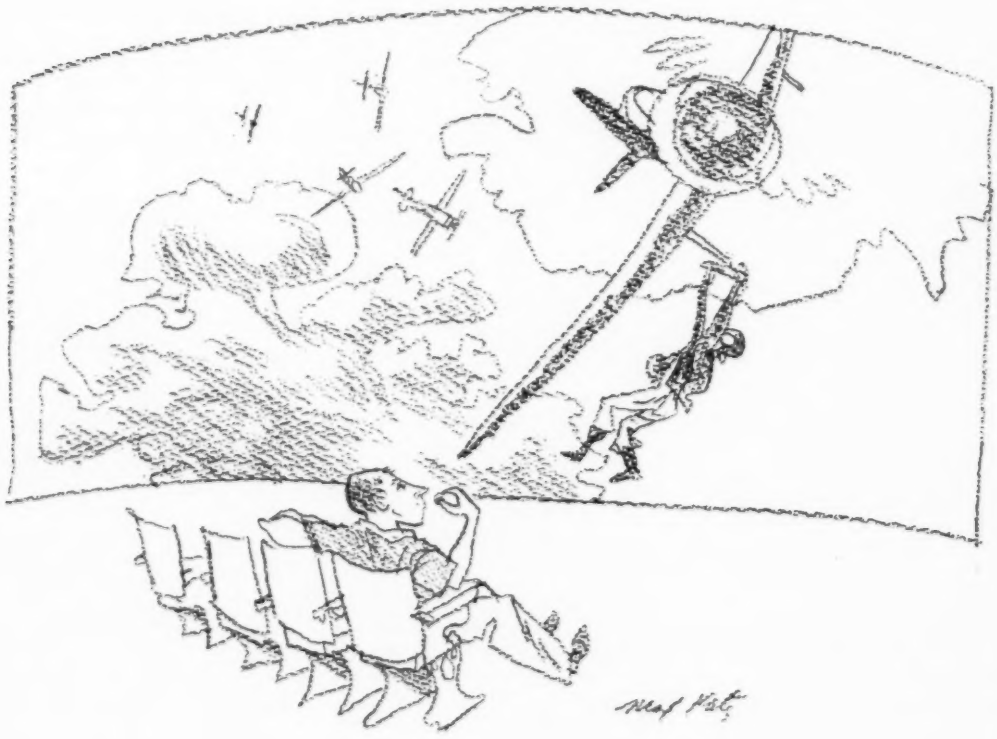
When you have trouble in an airplane, there are at best a fairly large number of life-saving alternatives. As far as I am concerned, there are more of them in the air than on the highway, where an oncoming car on your side of the road, passing on a curve, may reduce your alternatives to almost zero. These units are your treasure, money in the bank, the buffers against chance, fate, bad weather, or even your own fallible judgment . . .

. . . When the hangar-flying drifts around to hairy stories, be proud that your narrative is too dull to relate. Let nothing happen to you worth telling about. Go thou and grow old and stodgy. Get your excitement emphatically by observing the curdling exploits of Jimmy Stewart and John Wayne on the magic silver screen. Titillate your wife by an impassioned account of how the manager of the airport grill threatened to arrest you when you tried to kick your dime back out of an empty candy dispenser.

Now I am a private pilot only. I look forward to dancing the skies on laughter-silvered wings, to winging to my destination in a safe, straight line, far above the twisting hazards of the increasingly expensive highways. There are no toll-roads up there in the blue, no bill-boards on the clouds, no speed traps, no traffic lights. There is only the challenge to my imagination, and to my good common sense.

I must finish now. The ashes are glowing in the fireplace. Cynthia has the coffee on, and I have marshmallows to toast. ●

Courtesy of AIR FACTS magazine.



Do I fly in such a way that it could happen to me?

LIFT-OUT

Disassembling this downed T-34 to recover it would have been costly, time consuming, and possibly have caused further damage to the aircraft. So a giant Army H-37 helicopter hovered over the little T-34 while ground crewmen attached cables. Then its rotors were revved up and the yellow *Mentor* was gently hoisted from the wooded area into the sky and back to home base. The entire operation, which would have required days had the plane been disassembled, was completed by Army-Navy teamwork in just 20 minutes.

The Bureau of Aeronautics Maintenance Representative (BAMR) Western District has also reported successful recovery of damaged aircraft from hitherto inaccessible areas by HR2S helicopter. However, BAMR cautions units employing these techniques that full evaluation has not been made, and suggests the following procedures, which were used in their recoveries.

- Determine from temperature, altitude, terrain, load, wind, etc., that recovery can be safely accomplished.
- Establish emergency procedures in case of engine, blade failure or fire.
- Maintain landing gear in the "down" position during recovery operations.
- Provide ground crew with suitable tight clothing, goggles, face masks, hard hats and other safety clothing. Hovering HR2S whips up 75-100 knot winds during hook-up operations.
- Provide radio communication between ground crew and HR2S crew.
- If air transit involves crossing vehicular traffic arteries, secure permission from civil authorities for airlift.
- Prior to take-off from home base, attach standard external cargo sling with a quick disconnect to HR2S.

- Remove rotor blades, fuel and other flammable liquids from disabled aircraft.
- Do not remove the engine unless the mounts are broken or the total load exceeds 6000 pounds.
- Close all openings in the disabled aircraft to reduce drag and minimize any tendency to sway.
- Discharge static electricity from the hovering aircraft with an insulating grounding device before commencing attachment.
- Maximum and minimum speeds and altitudes are discretionary. So far the "slow and low" system seems best.

The routine sub hunt became a tragic

NIGHT ORDEAL

when the aircraft struck the sea.

THE night was dark. There was no moon although stars were visible through the scattered clouds. Several hundred feet below the S2F cockpit five-foot waves rolled across the expanse of the ocean whipped by a brisk northwest wind.

The anti-submarine warfare training hop had been strictly routine. Except for several breaks for a cigaret, the pilot had been at the controls since the four-plane launch from the carrier at 2000. However, each time the copilot (who was also the designated plane commander) had asked the pilot if he was tired and wanted to be relieved, he had replied that he was feeling fine.

Two crewmen were aboard in the aft compartment—one operating the MAD (Magnetic Airborne Detection) equipment and the other, the radar.

At 2230, the aircraft made contact with an exercise submarine. The crew's interest revived. A half-hour later, three destroyers appeared in the contact area. The aircraft began coordinated tracking and attack tactics.

The S2F came across the contact at an altitude of approximately 200 feet, then pulled up to 400 feet. The copilot instructed the pilot to make a left 180-degree turn and drop a smoke marker about 100 yards to the east of the controlling destroyer to mark the contact. He, himself, was engaged in writing a narrative of the flight on a plotting board on his knee. (Squadron doctrine required a complete narrative for ASW flights and assigned the responsibility to the senior pilot.)

As the aircraft was in a left turn, he questioned the pilot.

"Did we make our first run on a heading of 110 degrees?"

The pilot turned to look at him and nodded his head.

"That is correct, sir."

"Okay. Continue," the copilot said, making an entry in the log.

He had scarcely spoken these words when there was a solid bump. Water sprayed across the windshield. Five or six light bumps followed in rapid succession. Then it seemed as if the aircraft was airborne again. Momentarily everything was quiet. Then the aircraft struck the water with a tremendous tearing, banging crash. Flashes of red and yellow light illuminated the cockpit and water poured in over his legs.

Trapped

Water was already up to the copilot's shoulders as he unfastened his safety belt. He reached for the escape hatch handle overhead and tried with

both hands to turn it. It wouldn't turn in either direction. By now water was up to his mouth and nose. In desperation, he knelt down under water and bumped the hatch with his helmet in a futile attempt to dislodge it. He surfaced for a fast gasp of air mixed with water, then submerged again. He kicked the side window four or five times but the water kept him from delivering any power. At this point, he faced the realization that he was trapped.

Fighting panic, he knew he had only one course of action—to go out the rear of the aircraft. In an attempt to leave the water-filled cockpit, he fell over what he believes to have been the center instrument console. As he instinctively threw his hands up to catch himself, his right hand went

Continued from preceding page

through the pilot's hatch. To his surprise, the hatch was open. He assumed that the pilot had escaped from the aircraft through the open hatch. He never knew what happened to the two crewmen in the rear compartment. (In spite of an intensive search by air and surface units after the accident, the pilot and two crewmen were not recovered.)

Frightening Bang

As he gripped the edge of the hatch and pulled himself into the pilot's seat, his head was jerked to the right and he realized that his radio cord was still plugged in. He gave the cord four or five violent yanks away from his helmet without result—he was yanking on the part above the disconnect. Frantically he clawed his helmet off and pulled himself through the hatch.

As soon as he cleared the aircraft, he pulled both toggles to inflate his life vest. He knew his inflated life vest would take him to the surface. With no idea which way was up, down or sideways, he waited for a feeling of motion before beginning to swim.

"It was at this time that a Practice Depth Charge went off," the survivor recalls. "It was the most frightening thing I have ever experienced. I thought my eardrums would burst. Simultaneously, I saw a very bright light . . . then I had a feeling of movement and began to dog-paddle rapidly in that direction. Another PDC went off two or three seconds later but it didn't faze me. As I broke the surface of the water with my ears ringing, a third PDC and then a fourth exploded in very rapid succession . . . I gasped for air and immediately went under again. I must have come up and gone under five or six times before I could stabilize myself."

Water Rough . . . Weather Chilly

The water was quite rough with waves five feet high. There was a 15 mph wind blowing from the northwest. Air temperature was 59°F., water temperature, 72°F.

The survivor examined his life vest. It felt spongy . . . partially inflated. Unfastening his oral inflation tube, he managed, with considerable effort, to blow the vest up. He swallowed a great deal of water during the process, became violently ill and vomited several times.

Meanwhile, the aircraft in the ASW exercise were ordered by the carrier to return. A radio check during the return flight disclosed that the S2F was missing. The last radio transmission from the plane had been just before the return aboard order. The squadron commander, the senior flight leader of the launch, remained airborne to get SAR underway . . .

Flare Sighted

About five minutes later, the survivor sighted a plane coming toward him from the left. Frantically, he ripped open one of the pockets on his life vest and pulled out a signal flare. In the darkness, he had difficulty determining which was the night portion. Finally, he located the identifying lumps and pulled the ring. The flare lit off immediately. However, the aircraft continued on past him, made a 180-degree turn and flew off.

Although the pilot of the search plane did not see the survivor's signal flare, someone else did. A lookout on the fantail of a destroyer escort saw and reported a bright red flare and then a white flare near the area in which he had previously spotted a low-flying plane. "The DDE took no rescue action at this time," the AAR states, "because the reported sightings were evaluated by the OOD as either a smoke light of which there were many in the area or . . . as a weapon marker."

After the search aircraft had flown off and the survivor's night flare had burned out, he pulled the day smoke end "to see if anything would happen." When nothing did, he discarded the flare.

(A check of flares in use in the survivor's squadron turned up 11 which had been declared unserviceable by Ordnance Pamphlet 1515 (2nd Rev.) dated 4 March 1958.)

Slightly Frantic

"After the airplane disappeared, I had a very serious let-down," the survivor states. "I think at this point I became slightly frantic. I went under water five or six times, swallowing salt water each time. I couldn't see anything. Large breakers kept rolling over me and hitting me in the face. I decided to concentrate on trying to improve my condition as much as possible."

He observed that his life vest was hanging away from his body. Thinking that the straps of the vest were out all the way, he checked but found that the buckles were cinched up as tight as possible.

"About this time, I got a considerable fright when something hit me in the back. I instantly thought of a shark or some other fish. I whirled around in the water and found two smoke lights bumping against me. I grabbed them with the idea that I might be able to use them for extra flotation and stuffed them in the front of my life vest. They took up the slack in the vest and stayed

put without further securing. I was in the middle of 15 or 20 smoke lights all within 10 or 15 feet of me. I dog-paddled over and collected four more which I stuck between my legs. In the back of my mind, I had the idea that I might be able to light them off somehow with my knife." (If he had been able to actuate the smoke lights he might have burned himself badly.)

At this time, he noticed two dim white lights on the horizon and decided to gamble his second flare. Neither end of it worked. He threw it away.

Cold Takes Over

"I'd been in the water about a half-hour," he continues. "The cold was beginning to have its effect on me. I started to shake all over. My right

Continued from preceding page

wrist which was badly cut was slowly becoming paralyzed. I couldn't move my fingers. I tried exercising my arm by moving it through the water and flexing my fingers but it was an exceedingly hard task.

"I put my knife back in its sheath on my right hip, but I was unable to fasten the strap across the top of the handle so eventually I lost the knife.

"Some time before, I had taken my whistle from my life vest pocket and was blowing it as well as I could. It was an ordeal. Nearly every wave going over me would fill the whistle up with water. It took a tremendous amount of air pressure to blow the water out before I could whistle. I blew my whistle continuously with one-minute rest periods. I finally got violent cramps in both jaws. My lip muscles gave way completely. To keep the whistle in my mouth and bolster the muscle strength in my lips, I held my right hand to my face and put two fingers over my lips and clamped down on the whistle by holding it and pressing against my mouth. This enabled me to continue blowing.

Survivor Remembers Flashlight

"I must have treaded water and dog-paddled for another 35 to 40 minutes before I thought of the one-cell flashlight on my life vest—I think I overlooked it because it was under water. At first it would not light but I kept working with it and finally it came on. I knew that my whistle and this flashlight were my only hope.

"Finally, I succeeded in getting the flashlight unfastened from my life jacket. I waved it overhead as much as possible but at times muscle cramps forced me to bring both arms down and the flashlight would go under water. Several times during this period I had violent cramps in both thighs and calves. On at least three occasions, I lost the smoke lights between my legs when I extended my legs and moved them to get rid of cramps. Each time, I recovered the smoke lights and replaced them. I have no idea how long I continued in this manner . . . I decided when the small one-cell flashlight started getting dim that I had better conserve it until something came into the area . . . I continued to blow the whistle although not as often as before . . . I located the Little Dipper and finally determined that if I kept it in sight the breakers would go over me and I would take very little salt water . . ."

Bleeding Badly

The pilot states that the cut on his right wrist was bleeding badly, and that he got the "wild idea" that he was "going to bleed to death." Without thinking, he stuck his flashlight in the left thigh pocket of his flight suit without zippering the pocket. He seized his arm above the elbow and clamped it as tight as he could to stop the bleeding—so tight that he got severe cramps in his left arm which forced him to release his grip.

With his teeth chattering and his body shaking so badly that he couldn't hold on to anything, he was almost ready to give up. He was convinced that nobody was ever going to find him. Relaxing, he lost one float from under his life vest and went under water for several seconds. As he swallowed salt water he gagged. The gagging re-

vived him. Desperately he paddled up to the surface again. Retching and vomiting, he determined to hang on as long as he could. A few minutes later he saw red lights—the red rotating Grimes lights of an airplane.

"I could hardly believe my eyes," he states. "I lost my head . . . shouted and waved . . . Frantically, I fumbled in my flight suit pocket for my flashlight. By the grace of God, it was still there even though I had not zippered the pocket up . . . I got the flashlight on. It was dim but still working . . . I took it in my left hand and waved it in as large an arc as I possibly could."

Sighted

The pilot of the plane overhead was the survivor's commanding officer. The plane's arcing searchlight caught the survivor. The aircraft went over, made a 180-degree turn and on the second run dropped a smoke light within 25 yards of the man in the water.

"I was overjoyed—I could hardly believe it was true," the survivor states. "I decided I had to get to that smoke light or die in the attempt. I swam and swam and swam but I could never gain on it. Finally, realizing how futile this was, I sat back in the water and concentrated on staying afloat. It was absolutely all I could do, the way I was shaking. I had no more strength left and was getting continuous muscle cramps in almost every part of my body. I was getting cramps in places I never knew you could get cramps—in my chest, under my armpits, even between my shoulder blades.

"I believe it was only a few minutes after this when I became conscious of a white light approaching on the horizon. The smoke light had momentarily destroyed my night vision. I started blowing my whistle as hard as I could and waving the flashlight for all I was worth. I did not realize at the time that it was a submarine."

Events Aboard the Submarine:

2346—Sub surfaced . . .

0020—Received radio information an aircraft was missing. Manned air search radar to plot all ships and aircraft within range. Readied man overboard equipment.

0034—Sighted small light bearing 314. Headed for it at best speed . . .

0038—Light identified as fishing boat. Ordered course for area of last submerged operations with aircraft . . .

0039—Changed course on sighting two lights in water . . . adjusted course several times to pass west of westernmost of two lights. During this run to the south-southeast an S2F made searchlight runs in the vicinity of the lights. Further he made one parallel pass over, wiggled his wings and turned searchlight on area sub was approaching.

0040—Saw tiny light for brief period to left of westernmost of lights now identified as smoke lights.

0040
to
0100—Tiny light became readily discernible. Man overboard party on deck. Searchlight, periscopes manned.

0100
to
0106—Commanding Officer took conn. Came to all stop. Passed 300 yards west and south of western smoke float. Heard whistle and yelling from direction of small light. Returned whistle blasts, hailed and turned searchlight around area. Maneuvered to recover man. What was earlier thought to be, and reported as, life raft turned out to be man in mae west jacket. Tiny light sighted turned out to be one-cell flashlight.

Swimmer Assists

"The sub pulled within approximately 25 to 30 yards of me," the survivor states. "I was blinded by the white light. I heard them yell, 'Can you swim to us?' I yelled back that I could not. No sooner had I made this statement than I heard a splash. In a very few minutes someone had his arm around me and was pulling me to the sub. I distinctly recall their putting a line around me. Then I lost consciousness."

Aboard the Sub:

0106—All Stop. Secured engines. Man 15 yards off port bow. Sent swimmer in water to assist man. Man was virtually helpless from overexertion in attempting to remain afloat and alive. His efforts to do so were magnificent. Had buoyed himself up with smoke floats under life jacket and between legs. Was completely chilled by nearly two hours in water. His efforts to stay alive, to blow whistle and yell in spite of painful injuries are most admirable. He was in complete command of his mental faculties. Since he was unable to help himself, it took four minutes to get lines around him to ease him up on deck.

Taken Aboard

"The next thing I knew I was lying on the deck plates of the submarine and they were cutting my clothes off," the survivor continues. "After this, I recall I was on a bunk in the forward torpedo room and they were putting blankets and hot towels on me. The submarine boys were terrific—they had a bucket brigade going bringing hot towels and blankets and keeping me covered. They pulled

Continued from preceding page

all of my wet clothing off and were holding me down. I'm afraid I wasn't giving them much assistance as I was continually getting involuntary cramps in my arms and legs. I would kick and wave my arms although I certainly did not intend to do so. The chief hospitalman gave me a shot of morphine and I began to settle down . . . A doctor from a destroyer arrived on the scene but it was at least two hours before he could start treating my wounds and sewing me up. The sub skipper insisted on moving me to his cabin. Never in my life have I seen such hospitality. I know they were checking on me continuously the remainder of the night . . . "

The following morning the squadron commanding officer and flight surgeon arrived by helicopter from the carrier. The flight surgeon remained with the survivor until the sub made port the next day.

Comments on Survival Gear

The rescued man has a number of pertinent comments on survival gear and procedures:

"First, let me say I do not believe that any pilot or crewman can be in too good physical condition to cope with sea conditions . . . Although I am not in the best of shape, I am in better-than-average shape for my age. I feel this is imperative if anyone is going to survive under these conditions.

"Secondly, I feel more thought should be given by all pilots and crewmen to their individual survival equipment, particularly their life vests, flashlights, and signal flares, and the location of their knives . . . I know I personally will check my mae west thoroughly from now on."

Life Vest Tested

After the survivor's recovery, his life vest was tested. The jacket was airtight. An "observer-pilot aboard the rescue submarine" stated that both CO_2 cartridges were punctured but that one cartridge had a smaller hole in it than the other. The cartridge container caps were not completely screwed down and were slightly loose.

Twenty-six life vests being used by the squadron were selected at random for inspection. Fourteen belonged to air crewmen, 12 to pilots. In seven cases, one CO_2 cartridge failed to inflate its compartment of the life vest. In one case, both CO_2 cartridges failed to do this. *The CO_2 cartridges failed to inflate the life vests because the caps on the cartridge containers had not been screwed down tightly and consequently did not hold the cartridges firmly in place. When the bayonets were actuated when the toggles of the vests were pulled, the bayonets could not puncture the CO_2 cartridges with force because the cartridges were loose in the containers.* In each case, the individual pilot or air crewman had inspected the CO_2 cartridges after return of his life vest from a routine inspection at the para-loft. In each case, the pilot or crewmen had failed to secure the container caps properly.

In the entire group of 26 life vests, there was only one mechanical failure of the inflation apparatus: a bent pivot pin which allowed excessive play in the firing mechanism.

Plans to Relocate Some of Gear

"I am going to relocate some of my gear in pockets that I can reach much easier," the survivor continues. "In this regard, it is quite simple to reach the thigh pockets of flight suits. The lower pockets by the ankle can be reached but it is difficult and you take much salt water when you bring your knees up to your face. I intend to procure an additional flashlight and have the rigger sew it in (a pocket) on my flight suit.

"It goes without saying that the life raft would have been invaluable and I know it would have been fairly easy to get the raft out had this been a normal ditching. However, when contact was made with the water in the manner in which we hit and with my escape hatch jammed, I had but one primary thought and that was, of course, to get myself out of the airplane. I very nearly did not succeed in doing even this. Evacuating the life raft and parachute was out of the question.

Old Standard Advice Still Holds

"That old standard advice about wearing gloves still holds . . . it is rather difficult to work a plotting board and write a narrative while wearing gloves—I had taken mine off and they were lying in my lap. Naturally, I did not have time to get them on; I do not even know where they went. As a result, my hands are considerably lacerated. I am sure I would not have sustained the bad cut on my right wrist had I been wearing gloves. If one does insist on removing gloves, they should be placed in the flight suit. Had I done this at least I would have had them with me while I was in the water."

The survivor's shoulder harness and seat belt were fastened at the time of the crash. Upon impact, the inertia reel locked properly.

The survivor's one-cell flashlight was visible to the rescuing submarine at a distance of *2½ to 3 miles.* His whistle was heard from a distance of *2 miles.* ●

LOOSE CAPS

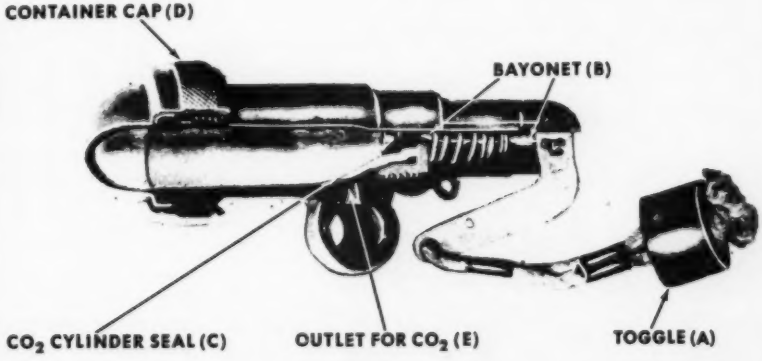
THE life vest of a crewman from an A3D-2, which crashed alongside a carrier, failed to inflate when he pulled the toggles. Instead of inflating the vest orally, he relied heavily on his ability as a swimmer to remain above water. He managed to stay afloat until picked up by plane guard destroyer 20 to 30 minutes later. After the rescue, he found that the caps of the CO_2 cartridge containers in his life vest were not tight. Once the caps were tightened, the cylinders inflated the vest properly when the toggles were pulled.

After a recent ditching of an HSS-1N, the pilot was unable to inflate one side of his life vest. He had preflighted his personal survival gear but overlooked the fact that one of the CO_2 cartridge container caps was not tight. Shortly after the accident, he was picked up by a rescue helicopter.

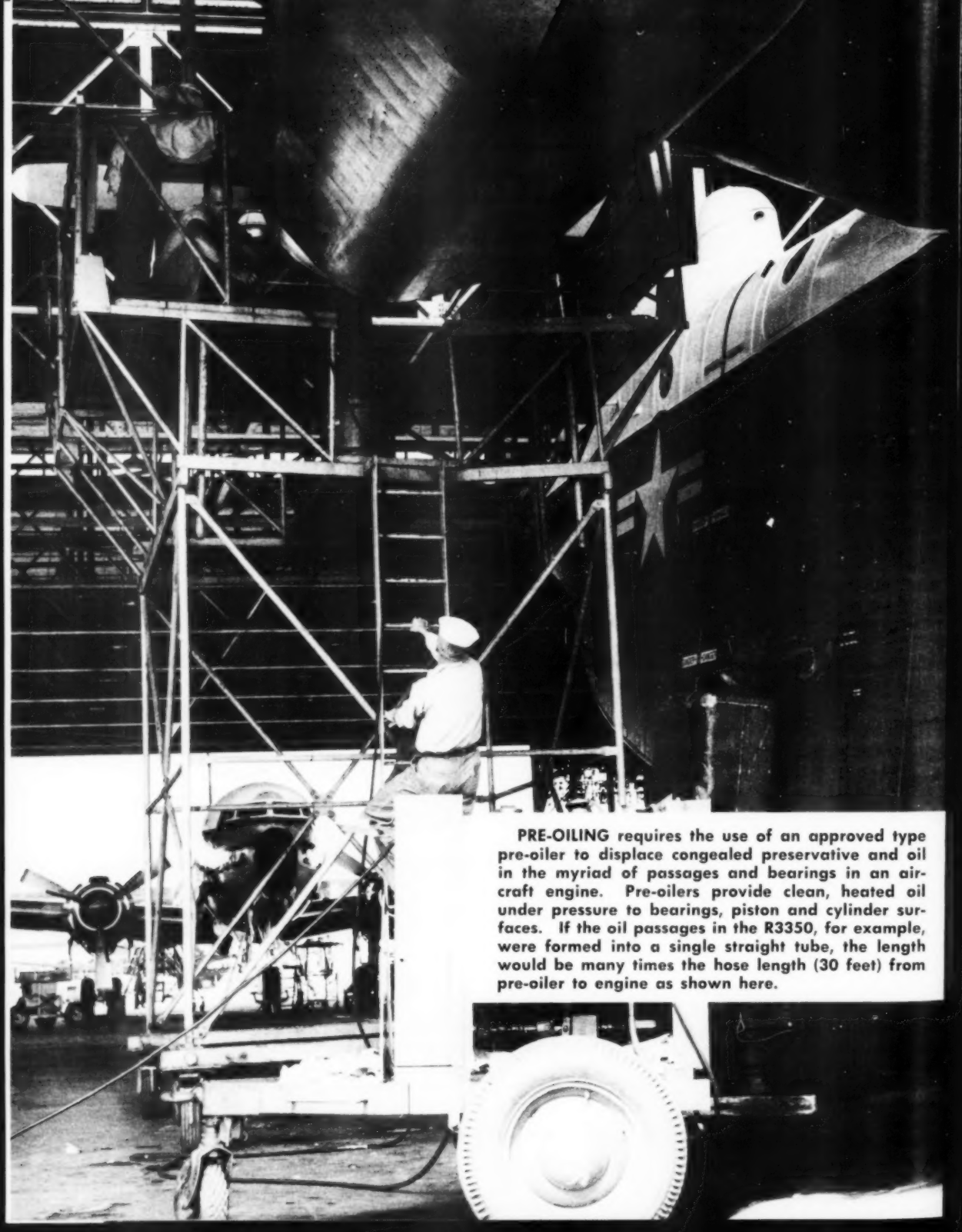
When the caps on CO_2 cartridge containers in a life vest are not screwed down tightly, they cannot hold the CO_2 cartridges firmly in place. The toggles of the life vest are pulled and the bayonets are actuated *but* the bayonets cannot puncture the CO_2 cartridges with force if the container caps are loose. The result? The life vest cannot inflate properly.

Are you sure that the CO_2 cartridge container caps on your life vest are screwed down tightly?

Ed. Note. For a report on what happened when 26 life vests were inspected in one S2F squadron, see the story ending on the preceding page.



When the toggle A is pulled, the bayonet B is forced into the CO_2 cylinder seal C and punctures it provided that the container cap D is screwed down tight. If the container cap is loose, the bayonet pushes the CO_2 cylinder up against the cap without puncturing the seal and no CO_2 is released to inflate the life vest compartment. When the cylinder is punctured properly the CO_2 will vent through the outlet E into the life vest compartment.



PRE-OILING requires the use of an approved type pre-oiler to displace congealed preservative and oil in the myriad of passages and bearings in an aircraft engine. Pre-oilers provide clean, heated oil under pressure to bearings, piston and cylinder surfaces. If the oil passages in the R3350, for example, were formed into a single straight tube, the length would be many times the hose length (30 feet) from pre-oiler to engine as shown here.

PRE-OILING:

THE WAY TO PROLONG AIRCRAFT ENGINE LIFE

NOW that the magnetic chip detector systems are working well enough to reduce the reciprocating engine failure caused major accident rate the problem rises as to reducing the number of engine failures. On the maintenance side of the picture, proper pre-oiling procedures can go a long way in helping out. Why do the engines need pre-oiling?

Integral to engines are the network of valves, lines, strainers, pumps, tubes and tanks—the myriad of passages and accessories which make up the pressure oil system. It is this system which has the responsibility of providing that thin layer of liquid which is the margin between proper operation and engine failure. The thin layer of oil is the ounce of prevention that is sometimes absent.

High horsepower demands adequate lubrication because of the high bearing load which occurs during operation. The increased intricacy of internal systems enlarges the possibility of inadequate lubrication at certain points. Out-of-commission-time of involved aircraft represents a considerable loss to the operator.

The reasons for preoiling are as follows:

1. To avert possible internal failure resulting from lack of lubrication.

2. To remove airlocks in the internal oil passages.

3. To lubricate bearing surfaces.

4. To soften congealed preservative oils and all seals.

5. To prime the engine oil pump and pressurize the entire lubrication system.

It is difficult to state categorically which engines have failed specifically because of improper or no pre-oiling. Engine manufacturers and the Overhaul and Repair Activities of the Navy have stated a belief that a great portion of Master rod bearing and reduction gear pinion bushing failures are a result of improper or no pre-oiling. As a matter of fact, the manufacturers' warranties do not cover negligence. The lack of proper pre-oiling is negligence on the part of the operator.

The following is the result of a Disassembly Inspection Report to graphically show just what happens to an engine that failed 13 minutes after takeoff when the ounce of prevention, *lubrication*, is missing.

1. All pistons were badly scuffed.

2. All of the master rod bearings were burned and scored.

3. All of the crankshaft main bearings were scored.

4. All of the oil scavenge pumps in the power case had cracked housings.

5. Teeth on the reduction drive fixed gear assembly were chipped.

6. All of the reduction gear pinions had the teeth stripped and broken.

Master Rod and bearing failure in 1820-84 (HUS-1). A temporary lack of lubrication caused the initial abnormal wear in the master rod bearing.

7. All of the pinion gear races and their respective bearings were burned and scored.

8. Seven reduction pinion shafts had failed in shear.

9. The rear end of the propeller shaft was burned and scored.

Conclusion: In view of the above information, it is believed that failure of the engine was the

Rear balanceweight assembly of R3350 is shown with failed bearing, Part No. R85WAC137030

Failure of the front and rear second order counter balance bearings are a leading cause of premature R3350-26WB engine failures due to metal contamination. These bearing failures, for the most part, are caused by lack of lubrication. This condition in turn is attributable to (1) Failure to properly and thoroughly pre-oil the engine subsequent to initial installation and, (2) due to momentary oil starvation during actual engine operation.

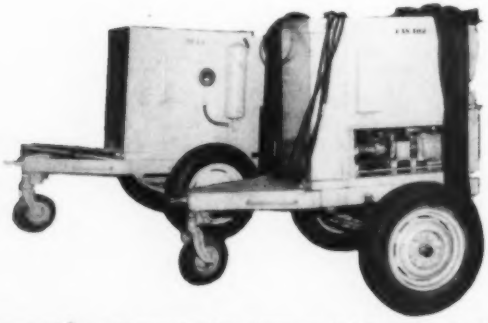
Continued from preceding page

result of a momentary loss of oil pressure during starting.

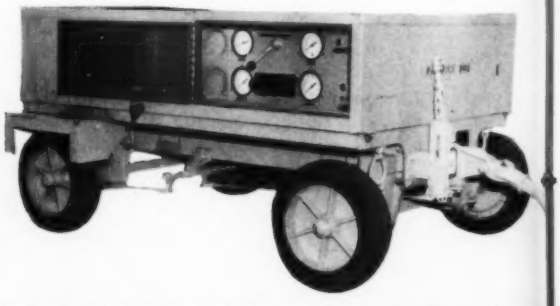
Pressure, forcing metal to metal without lubrication, causes metal scrapings and these can be distributed to critical areas in the lubricating systems of the engine. The engine may not fail immediately upon start or takeoff—it could fail after many flight hours.

A case in point is the recent report of an AD squadron aboard a carrier experiencing five engine failures—all took place within 60 hours after engine change. Investigation revealed that the ship had a pre-oiler on board but it had not been used, in fact it had not been used in the past two years!

Most of the requirements for proper pre-oiling are common-sense dictates. It all adds up to the fact that pre-oiling with the proper pressures and proper temperatures will keep the planes flying with less work for the crew. ●



Preservation machines—Machine shown at left is equipped with filter and pressure gage making it suitable for use as pre-oiler. Information on conversion kits is available from BuAer Maintenance Representatives of Eastern, Western, and Central Districts.



Equipment which is available for pre-oiling is the Preservation and Depreservation Machine, Model NP-2 Fed. Stock No. RH3540-652-4558-S131, above. Pre-oiling by means other than an external pre-oiler is not approved. FSN R4940-391-0406-S131, left, is approved if it is mbdified.

FOREIGN OBJECT

— Alien, unfamiliar

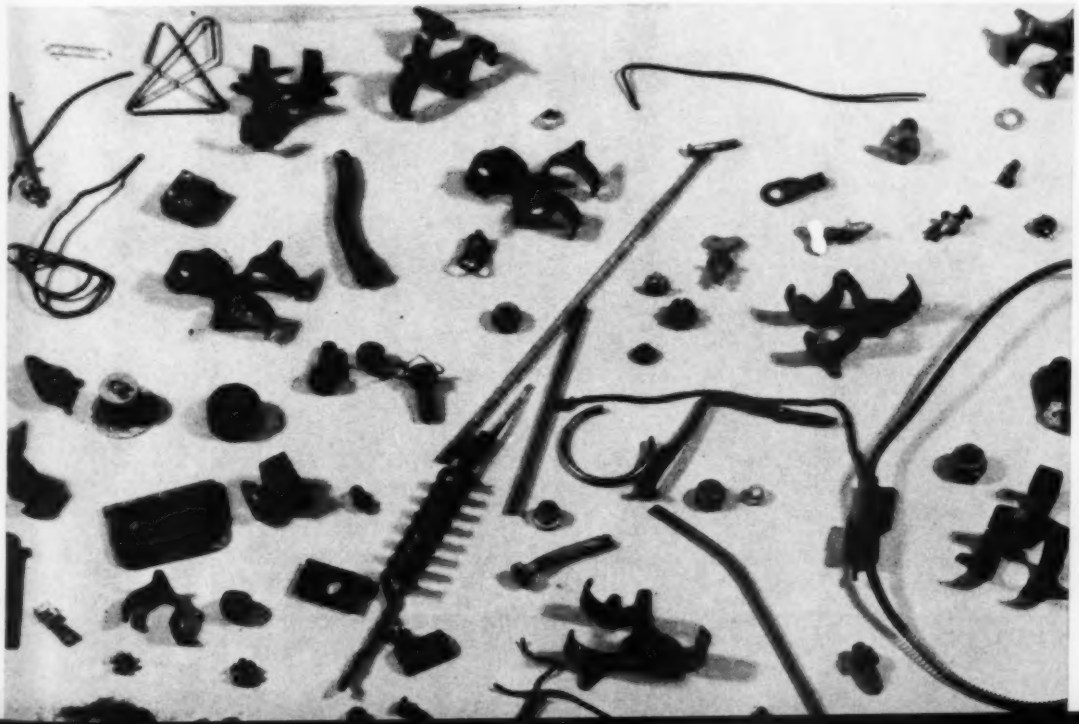
— Any material thing

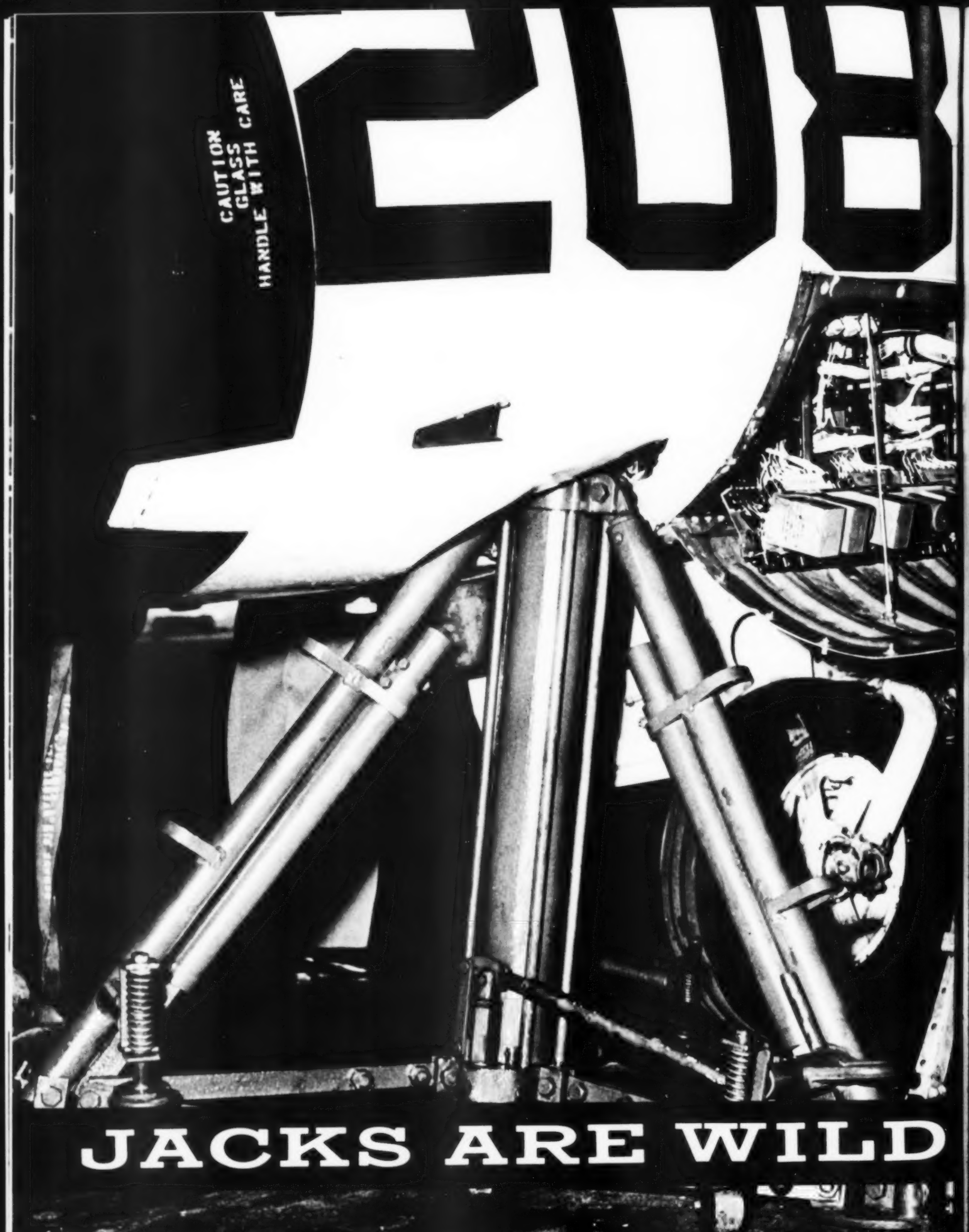
Together these words can mean several things but to a jet engine—they can only mean trouble, costly and time-consuming trouble. The introduction of an alien concrete reality into the hungry maw of a jet engine can produce one of the fastest depreciating events known to man; the instantaneous reduction of a quarter of a million dollars worth of precisely engineered power into a few dollars worth of useless junk. This we know—but what can we do about it?

Strange as it may seem, the answer to the majority of our trouble lies in the realm of the basic facts that every good girl knows well—*good housekeeping!* (Maybe all ground personnel should be women?) Look at the picture below—This sterling collection of miscellaneous junk was found on the runway by the crash crew during their weekly walk-down of the runway and taxiways. Now do you think the shoulder-to-shoulder pick-ups by conscientious personnel are doing any good? Do you recognize any of the items as perhaps belonging to your airplane? or your squadron? The paper clips prove that staff officers fly!

While frequent cleaning of jet operating areas is mandatory, it is still only treatment of the disease. What is also necessary is energetic application of preventive medicine. We have to eliminate as many of these foreign objects at the source as humanly possible. Check the following good rules and see how your outfit stacks up.

1. Check your tools before working on the aircraft and inventory them again after you finish . . . (The little ¾" socket dropped in the blades has probably ruined more engines than any other single item).
2. Keep all loose items out of your pockets when on the flight lines . . . especially jacket and hip pockets.
3. A look around the operating areas prior to turn-up.
4. Check your operating area frequently—When you see something pick it up.
5. A place for everything and everything in its place.
6. Keep duct covers on when the aircraft is secured.
7. Taxi at moderate speed and RPM.





JACKS ARE WILD

N

T
the
wor
and
disc
rem
laps
(ph
sho
gea
pit
T
A
in
DO
wor
plan
E
uns
was
and
indi
The
afte
the
inst
T
mov
gear
duri
inst
not
stall
was
airf
plish
inst
were
the
deck
the
was
pad.
at th
Tw
move
nel w
lock
At t
were
elect
crepa
time
tor h

NOTES AND COMMENTS ON MAINTENANCE

THIS F4D-1 was brought into the hangar and placed on jacks for an engine change. During the period in which power plants mechs were working on the engine, mechs from the airframes and electrical shops were correcting other aircraft discrepancies. Three days later the nose jack was removed. Two hours later the nose gear collapsed, and the aircraft fell on the nose jack (photo on page at left). Subsequent investigation showed that there was no safety pin in the nose gear and that the gear selector handle in the cockpit was UP.

The sequence of events is as follows:

At the time work was started, safety pins were in the gear and the gear selector handle was DOWN. The engine was removed, and no further work was accomplished on the airframe by power plants people until the third day.

Electric shop personnel started to work on an unsafe gear discrepancy shortly after the plane was placed on jacks. The gear was dropchecked and a bad indicator was found in the cockpit. The indicator was changed and gear dropchecked again. The electricians finished work on the plane on the afternoon of the second day. It was reported that the gear selector was DOWN and the gear pins installed at the completion of their work.

The following morning, the airframes mechs removed the port main gear from the plane. The gear selector handle and gear pins were not moved during this operation. The next day, airframes installed a port main gear on the plane. It cannot be determined whether the gear pins were installed at that time, and if the gear selector handle was DOWN. However, it was not necessary for airframes people to touch either item to accomplish their work. Shortly after noon, power plants installed the engine, the jacks under the main gear were lowered enough to let the main gear touch the deck. This allowed the nose gear to touch the deck and support the weight of the nose, and took the weight off the nose jack. The nose gear jack was then moved a few inches forward of the jack pad. The nose gear pin was not checked in place at this time.

Two hours after the nose gear jack had been moved slight movement of the aircraft by personnel working on it apparently caused the overcenter lock to work loose and the nose gear to collapse. At the time of the accident, power plants people were finishing up the engine installation, and the electricians were working on a tail bumper discrepancy. None of the work being done at this time required operation of the landing gear selector handle.

The accident apparently resulted from a lack of coordination among supervisory personnel working on the aircraft.

An ironclad policy has been established in which airframes personnel only will be allowed to raise or lower the aircraft with jacks. Airframes personnel have been thoroughly rebriefed to insure that all landing gear pins are in place and that the wheel handle is DOWN prior to lowering aircraft with jacks.

The CPOs in charge of the shops have been instructed to maintain strict coordination between all maintenance personnel when multiple jobs are being performed simultaneously on an aircraft.

All maintenance personnel have been instructed that when selection of the gear handle to the UP position is necessary to perform a check, the person making the selection will insure that the gear handle is in the DOWN position prior to leaving the cockpit.

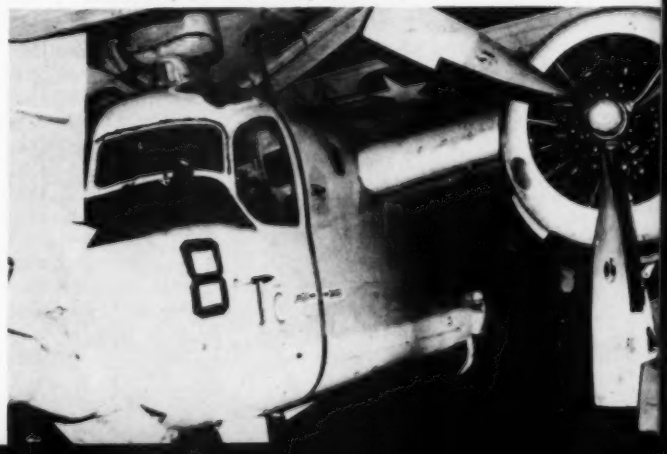
Besides poor maintenance practices this report indicates non-compliance with Bureau of Aeronautics Technical Order 2-48, which requires a functional test when any component of the hydraulic system has been changed.

What happened in this case can also happen to other aircraft as well—take the case of this S2F for example:

TWO men from the electrical shop were checking out the electrical circuitry of the radome extension and retraction mechanism on S2F-1. To electrically simulate an airborne condition the landing gear handle was placed UP. This was done by manually depressing the landing gear override solenoid and retracting the gear handle. The electrical system checked normal, and the men left the aircraft without returning the landing gear handle to DOWN.

The airframes shop was informed that the ra-

Lack of shop coordination also led to this . . . . . .



Continued from preceding page

dome electrical circuitry checked normal. Airframes personnel then proceeded to the aircraft to check for correct hydraulic operation of the radome. External electrical power was applied to the aircraft to energize the radome control switches. Then external hydraulic pressure from a type 10 gpm test stand was applied and immediately thereafter the nose gear and starboard main gear retracted. As the gear collapsed, the aircraft fell forward until its nose section contacted the rudder of another S2F-1, which had been parked just forward with a nose-to-rudder distance of approximately six inches.

The direct cause of this occurrence is attributed to the landing gear handle being UP when hydraulic pressure was applied to the aircraft. Failure of the electrical shop personnel to return the landing gear handle to DOWN, and failure of the airframes personnel to check the aircraft for properly positioned controls before applying external hydraulic pressure set the stage for this occurrence.

The squadron noted it is not an authorized practice to raise the landing gear handle to perform the electrical check of the radome system circuitry. Normally three men are assigned to this job; one man being in the cockpit manually actuating the cutout microswitch with a screwdriver instead of raising the landing gear handle. At the time the work order was received only two men were in the electrical shop and, rather than wait to do the job properly when a third man arrived, they went ahead with the check. The landing gear handle was placed UP to eliminate the necessity for a third man in the cockpit.

A check-off list specifically designed for use by all personnel is being compiled and will be required when maintenance checks using external power are performed. In addition to this, procedures will be used that do not require the movement of the landing gear handle to UP position unless the aircraft is properly supported on jacks.

The endorser wrote: "This report indicates that a lack of coordination and supervision within the shops of the maintenance department was a primary factor in this accident. The inspection of all overlap work accomplished by different shops is a continual necessity, and as soon as the vigil is relaxed, an accident is set up."

GROUND ACCIDENTS — Naval Aviation continues to be plagued with service-vehicle drivers mashing aircraft. It is recommended that supervisory personnel recheck their training and service procedures for loopholes and potential ground accident practices. Would it help to hold the supervisory personnel responsible for a ground accident caused by an improperly supervised Private First Class? Who in the last analysis is the supervisor?—*MARTCom Bul. 3750, 9-5-58*

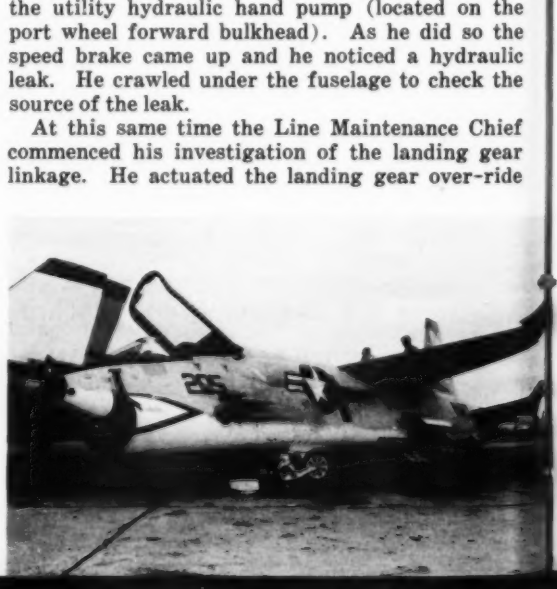
LANDING GEAR HANDLE MOVEMENT DEFINED —An F8U-1 was downed for the landing gear handle slipping from the UP detent when the guns were fired. That night, the handle linkage was adjusted by the night check crew and the aircraft was placed in an up status. The next morning the aircraft was preflighted, the wings were spread, the aircraft was fully fueled, and all landing gear ground locks were removed prior to the launch.

From his examination of the night check records the maintenance officer could not determine to his satisfaction that the landing gear discrepancy had been properly corrected. He then ordered the aircraft brought into the hangar to be placed on jacks to re-check the landing gear handle linkage.

The plane captain was told by the line chief to place the landing gear ground locks and the wingfold jury struts on the aircraft so that the aircraft could be towed to the hangar. At this point the maintenance officer, after a discussion with the line maintenance chief decided to have the landing gear handle linkage checked on the line. The line maintenance chief placed a nose gear ground lock on the nose wheel. He then climbed into the cockpit and had an NC-5 with DC power plugged into the aircraft.

The plane captain still thought the aircraft was being prepared for towing to the hangar, he placed a main landing gear ground lock on the port main landing gear. Seeing the NC-5 plugged into the aircraft and having previously placed the cockpit wingfold handle in the fold position, he actuated the utility hydraulic hand pump (located on the port wheel forward bulkhead). As he did so the speed brake came up and he noticed a hydraulic leak. He crawled under the fuselage to check the source of the leak.

At this same time the Line Maintenance Chief commenced his investigation of the landing gear linkage. He actuated the landing gear over-ride



switch and partially raised the gear handle. As he did so, the starboard landing gear folded. The plane captain, seeing the aircraft descending, scrambled from beneath the speed brakes. The F8U settled on its starboard wing and starboard unit horizontal tail and, bending the nose gear strut from its retaining fittings, further settled on the intake duct, and starboard wheel well doors (see photo on opposite page); there was no landing gear lock on the starboard main landing gear.

The primary cause of the occurrence was the failure of the Line Maintenance Chief to insure that landing gear locks were on all three landing gear prior to checking the landing gear handle linkage.

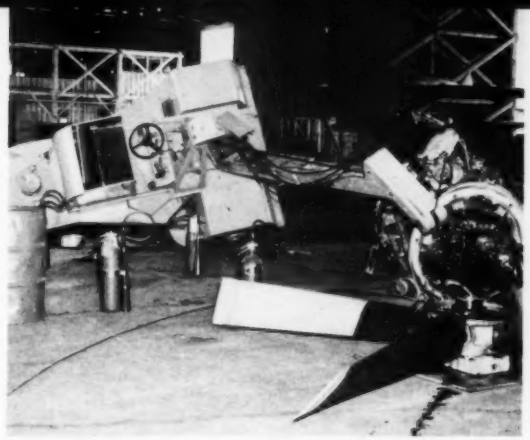
A secondary cause of the occurrence was the failure of the Line Maintenance Chief to be cognizant of the fact that the plane captain was applying hydraulic pressure to the utility system.

The decision was made to check the aircraft on the line to expedite operations. There was no intent to raise the wheels and the Line Maintenance Chief thought that there was no hydraulic pressure on the utility system. Therefore, with the installation of ground locks on all three landing gear, the examination would normally be routine and in accordance with instructions covered by NavAirLant F8U ATB Number 33 (Subject: F8U Aircraft, Landing Gear, instructions concerning).

As one endorser of the accident report said "This accident is a classic, and terribly expensive, example of the adage of 'too many cooks.' By ignoring the basic principle of actuating a major cockpit control only at the direction of a qualified outside observer, and by failing to communicate his intentions to the Plane Captain, the Line Maintenance Chief cost this squadron the use of a first line combat airplane, and wasted a large amount of the taxpayers' money."

Present maintenance procedures in some types of aircraft require movement of the landing gear handle for various system checks. In some squadrons maintenance practices allow the handle to be moved for reasons of convenience such as opening landing gear doors, etc. Existing instructions do not specifically restrict movement of the landing gear handle in *ALL* types of aircraft. It was recommended that movement of the landing gear handle except when the aircraft is airborne or fully supported on jacks be prohibited. Any movement of the landing gear handle while the aircraft is on jacks should be followed by a full cycle of the landing gear to the DOWN and LOCKED position.

Squadrons were directed to ensure that stiff-knees or down locks are installed at all times when the aircraft is not intended for immediate flight.



OFF BALANCE—After removing port engine (R3350-32W) from the P2V-7, the crane operator swung loaded boom approximately 80 degrees to starboard unbalancing the crane which tilted sideways dropping the engine from an estimated height of four feet to the hangar deck.

Squadrons should never rely on stiff-knees, circuit breakers or other devices, except full support on jacks, when the landing gear handle is to be moved for *any purpose whatever.*

CHIP DETECTOR TESTIMONIAL—The AD-5 was on a fourth engine run-in (slow time) flight, governed by T.O. 2-58 and squadron instructions. Power was increased from 1800 rpm, 28 inches MAP to 2400 rpm, 35 inches MAP, normal mixture. Slight roughness was noted and MAP required slight, periodic increases in throttle setting to maintain 35 inches. A severe backfire occurred 6 minutes later and the engine stopped. Throttle-RPM reduction gave intermittent engine operation but altitude could not be maintained. Instruments read: CHT 200°, oilpress/temp. 70 psi/75°, fuel press. 21 psi, OAT/CAT plus 6°, carb. air direct, altitude 2500 feet. A landing approach was set up. Two minutes after backfire the magnetic chip detector light came on. After a safe landing the front oil sumps were found to contain metal.

SHORT STORY—AD-6, strike damage, no injury. Maintenance factor. During FLP the oil pressure dropped and the engine quit. The pilot landed the aircraft short of the field. The oil sump plug had not been lock-wired.

FALL OUT—After being guided into the chocks, the pilot of a P2V-5F began shutting down. He suddenly became aware that he hadn't been given the signal to cut the engines, and turned around to look for the plane captain. Unable to locate the PC, he sent another crewman down to see if the pins were in. The crewmember reported back that the pins were not in and neither the plane captain nor the pins could be found.

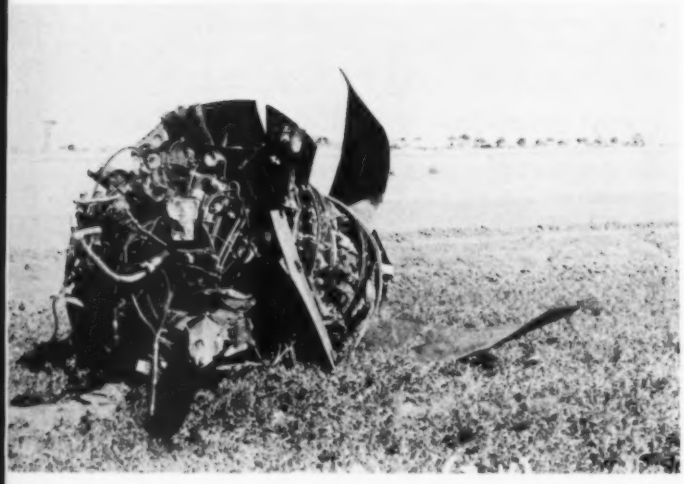
Continued from preceding page

As this was occurring the plane captain walked up. Dirty, bruised and bleeding, he handed the pins to one of the squadron maintenance crew. He had fallen out of the nose-wheel door onto the taxiway while attempting to lower the nose wheel ladder as the plane was taxiing to the parking ramp. His injuries consisted of a fractured jaw, broken teeth, cuts and bruises.

The pilot of the aircraft involved recommended that: (1) All flight crews be instructed to remain in their landing station until the aircraft is in the chocks. (2) After the wheels have been chocked by ground crew personnel the pilot should then tell the crew over the ICS that the plane is in the chocks and they may resume their normal securing duties. (3) The ladder in the nose wheel well should be raised and lowered by ground crew personnel.

STRIKE ONE—On the initial engine run-in flight of an AD-6, manifold pressure increased without manipulating the throttle. Attempts to decrease MAP by retarding the throttle was to no avail. RPM increased to 2900 so as not to overboost and the MAP went to 59". The engine was secured prior to attempting a landing. Landing short of runway the aircraft skidded into irrigation ditch. Pilot evacuated safely. Aircraft received strike damage. *See photo below.*

Cause of the accident — maintenance personnel error—The castellated nut was not properly installed on the connection bolt, nor was the control linkage properly inspected prior to flight.



ONE-WAY WASHER—While the F4D was being taxied the starboard wheel cracked, resulting in binding between the wheel and brake assembly. The pilot felt the drag on this wheel and pulled clear of the taxiway to have the trouble investigated. At this point the tire blew out. The brake assembly, axle assembly and forward underside torque scissors were damaged by the weight of the aircraft.

Investigation revealed 6 of the washers (Part No. 9522047) on wheel assembly (Part No. 9531642) were installed with the inside diameter countersink (*chamfer*) *facing the wheel instead of facing the bolt head.* This error results in a relatively sharp corner bearing against the radius between the bolt head and shank. Stress concentration set up by this condition resulted in 5 bolt heads failing in tension.

The reporting squadron recommended that the outside diameter be chamfered on the same side of the washer as the inside diameter. This chamfer will permit a quick visual check by supervisory personnel that the washer is installed right side up. At present disassembly of the wheel is required for this check.

TOO MANY SIGNALS — Following a normal start during a night practice alert scramble the pilot commenced taxiing his F4D-1 before the turbine air starting unit was pulled clear of the aircraft. The pilot mistook a light signal from an ordnance man for an all clear signal. The turbine starting unit steering handle caught on the starboard main wheel mount oleo scissors causing the unit to be pulled about one mile by the aircraft while taxiing.

Two tires were blown and the wheels damaged on the GTC 85-15 turbine air starting unit. Squadron SOP was changed placing sole responsibility to giving hand or light signals with the plane captain.

Recommendations from Engine Disassembly Inspection Reports

1. J-57—Insure that all fittings in oil system tubing are properly torqued. Excessive torque on fittings may cause chafe and shredding especially on silastic type seals.

2. J-57—After performing any maintenance and/or repairs, insure that all connectors are properly torqued and secured with safety wire as required. It should be observed that the oil pressure relief valve assembly, part number 208958, will loosen easily unless properly lock wired.

3. J-65—It is recommended that operating activities be sure they are not using J-65 Engine Bulletin 85 preoil check valves on J-65 Engine Bulletin 113 oil pump metering valves.

MURPHY'S LAW*

* If an airplane part can be installed incorrectly, someone will install it that way!

Inverted Pitot Tube, FJ-4

The squadron was accepting several FJ-4 aircraft from a Fasron that had performed a calendar major inspection on the planes. During the calendar inspection on one plane, the pitot tube was installed inverted. This discrepancy was not noted by the test pilot or by the pilot that flew two hops on the aircraft while transferring it to the accepting squadron. An acceptance check was performed and the discrepancy was not noted during the inspection.

During the preflight for the test hop, the test pilot noted the irregular installation but failed to realizes the significance of the error. A stall check was performed at an altitude during the hop and the airplane stalled approximately 12 knots IAS higher than normal. The angle-of-attack indicator worked properly and a cross check indicated the error was in the airspeed indicator. A normal landing was shot on the angle-of-attack indicator.

Suggest that you bring this to the attention of pilots and maintenance personnel as you might have a tendency to land short some of the times.

—*Anymouse*

Two-Way Relief Valve

The landing of an F3H-2M was made with the starboard gear indicating UNSAFE. During landing rollout, the gear collapsed.

Investigation revealed that the in line relief valve, located in the down return line from the main landing gear actuator was installed *backwards* in both port and starbord main landing gear systems.

The improper installation resulted in deforming the main landing gear actuator cylinder barrels and tearing of piston back-up rings and O-rings, plus scoring and shaving of the barrel interior. Due to piston and seal damage the starboard gear would not extend to a locked down position.

The relief valve was clearly marked as to proper orientation. It appears that the incorrect installation was made by the contractor prior to delivery of the aircraft.

Crossed Static and Pitot Lines

Erroneous airspeed indications at all configurations were caused by static line Part No. 25-60061-409 and pitot line Part No. 24-60061-407 crossed at T connections in nose wheel well. This was the result of incorporating ASC 129 on the F3H-2.

Both pitot and static lines which were supplied with kit labeled "static." ASC diagram shows incorrect connection; "before change" diagram shows correct connection. Six of 11 aircraft in the reporting command with ASC 129 incorporated had static and pitot lines crossed.

Upside Down Valves

Inverted flight oil valves were installed upside down in 3 T-28s recently. When installed in this fashion the tank pressurizes and the oil is lost overboard through the breather line. There are no noticeable indications of oil loss while on the ground because power settings normally used are not high enough.—*CNABaTra*

Reversed Spacer

A forced landing because of engine oil pressure loss in an AD-6 was due to the brass spacer for blocking off the high clutch oil pressure through the metering valve bellows body adapter (139491B) being installed *backwards*. When the shift to high blower was made, oil was allowed to flow into the water tank and eventually overboard. This faulty installation was made by mechanics who built up the QEC prior to installation.

Incorrect assembly of the brass spacer could have only been discovered by inspection personnel performing the engine build-up.

Noteworthy are the comments of the third endorser of the report: "This is considered another example of design leading to human error in that it was possible in this case to install the brass spacer in reverse. It is believed that increased emphasis on the human factors in aircraft design will effect great economies through reduction of incidents and accidents resulting from causes of this nature."

Clipboard

Tobacco

THE nicotine contained in tobacco is a quick-acting poison. Evidences of excessive smoking may be clearly demonstrated in depression of the nervous system and impairment of vision. The carbon monoxide which results from the combustion of tobacco, whether or not the smoke is inhaled, is absorbed by the blood stream in preference to oxygen and very slowly eliminated.

Even in light smokers this relationship between oxygen and carbon monoxide results in a lowering of altitude tolerance. Important, also, to aviators is the irritant action of tobacco smoke in the respiratory tract.

—OpNavInst 3740.7, 25 June 57

'T-Effect'—Ground Effect

FLIGHT Safety Bulletin Number 1 carried a brief article concerning "T-Effect" and the fact that there were theories and articles on this subject which were misleading.

The articles on T-Effect held that there was a magic altitude in the vicinity of 100' where you could fly with less power than required above or below that altitude. There were no adequate explanations given for this phenomenon, it was just stated as a proven fact.

Wright Air Development Center has completed a test of T-Effect. The test was thorough and conclusive. The concluding paragraph of the test report is quoted below: "That the phenomenon encountered during the test program *was ground effect*, and that *no* evidence was obtained to support the overwater condition described as T-effect. (italics supplied)

In other words, ground effect is the only advantage that you will get from flying at extremely low altitudes. Ground effect does not exist when you are higher than one wing span above the surface. At one wing span of height it begins to take effect. The lower you go, the more effective it is. The slower you fly, the greater the percentage increase of ground effect.

So, if caught in that particular kind of bight where you don't have enough engines or enough fuel to get back home, fly low and slow. How low? The lower the better as long as you stay out of the water. How slow? Subject to more "ifs" and qualification than the low part, the slower the better, too. (Ref: WADC Tech Note 58-250.—*U. S. Coast Guard Flight Safety Bulletin*)

Quality Control

"The problems of training and proper supervision during a period of transition are recognized. At the same time, however, this should be a period in which greater supervision and care must be exercised. Where the loss of a costly aircraft and the life of a pilot are involved, the necessity of having maintenance work checked and rechecked cannot be over emphasized. This necessity is not peculiar to a squadron in the process of transition, but is fundamental in every squadron's maintenance procedures." — *From an AAR*

Answers to Quiz, page 21

1. Planning, Enroute and Terminal.
2. C, until all letdown plates have been replaced by the new terminal area charts being phased in. These show feeder facilities leading from the high altitude facilities to the air field.
3. In the index contained in Sec. I of the Flight Planning Document.
4. Green for low frequency facilities and airways, RBns, ranges. Black for high altitude facilities to the air ways, VOR, TACAN.
5. Flight level 270 (27,000').
6. The length of the effective time of the notice. The more temporary are in the Enroute Supplement, those of a longer time limit are in the FPD.

Write It Up!

HAVE you ever churned into Hickam or Lajes with a malfunction on your aircraft which didn't seem serious but, if written up, might cause a delay? What did you do? Did you pass the information along to the stage crew without indicating the deficiency on the 781A and on the MATS Form 175. That would take care of everything. Ole Pete would know what was wrong, but there wouldn't be any tie-up unless Pete wanted it fixed.

Sound familiar? How many deficiencies can you handle informally and still function safely?

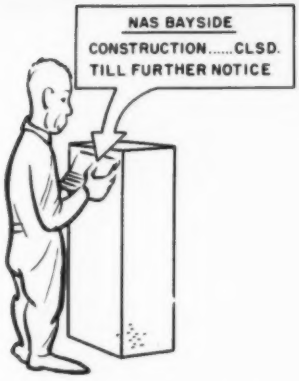
Here are a few facts that may change your thinking on this subject. They were reportedly gathered by the CAB during inquiry concerning the sudden "pitching down" of a transport at a rate near 15,000 feet per minute.

The pilot testified that he knew before takeoff that the autopilot had malfunctioned on a previous flight. He had been told of the incident by his engineer, who in turn had been told by the engineer of the previous flight. The captain of this earlier flight said he did not enter the incident in his log, "because I had no idea of the seriousness of it."

When malfunctions are logged, we allow maintenance personnel to add their knowledge and experience to that of the pilots' and engineers' in reaching the best possible solution. WRITE IT UP!

—MATS "Flyer"

THE CROSS COUNTRY

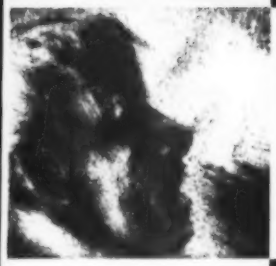


MULEKICK BASE.... OFFICIAL BUSINESS ONLY

HIGHNOSE FIELD... EXTENSIVE DELAY FOR TRANSIENT SERVICES

FILMFAM AIRPORT... PRIOR PERMISSION REQUIRED

EAST BALEFUL STATION... NO TRANSIENT PARKING OVERNIGHT



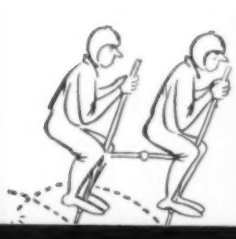
NIGHT ORDEAL

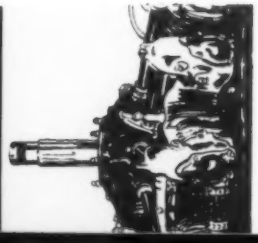
MURPHY'S LAW

truth and consequences

NOTES FROM YOUR FLIGHT SURGEON

Safety is a state of mind, and pilots can transmit it among themselves. It can be contagious: one pilot talking to another about the necessity of the check list, strict adherence to minimums, practice of emergency procedures. If safety can be a disease, let's start an epidemic in the cockpit.





THE FIRST TEN

LIN